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YEAR-END RURAL INCOME DISTRIBUTIONS REVIEWED

Beijing NONGCUN GONGZUO TONGXUN [RURAL WORK NEWSLETTER] in Chinese No 11, 5 Nov 82 pp 32-33

[Article by National Agricultural Collective Economic Administration Center, Ministry of Agriculture, Animal Husbandry, and Fishery: "Conscientiously and Carefully Carry Out Year-end Income Distribution Work"]

[Text] Right now the broad masses of rural cadres and people are studying and carrying into effect the spirit of the 12th Party Central Committee to usher in a new work situation. This is extremely beneficial for performance of year-end distributions work. This year, thanks to the establishment in rural villages throughout the country of various forms of production responsibility systems, particularly the predomination of responsibility systems in which complete responsibility for tasks is assigned individual households, the enthusiasm of the masses has been stirred. Despite fairly serious disasters in some places, the country's agriculture as a whole has made substantial increases in both output and earnings. This has laid a fine material foundation for carrying out the work of distributing earnings. This year's distribution work faces multiple forms of responsibility systems, diverse ways of calculating compensation, multiple accounting systems, varied contracts, and different provisions for rewards and penalties. This requires that we proceed from realities and be particularly careful in doing the work. Additionally, in some newly instituted responsibility systems in which full responsibility for work completion is assigned to individual households, and in newly separated production teams, the amount of work involved in distributing earnings will be greater this year because financial systems and distributions have yet to be completed or perfected, and workpoints, property, debts, and credits have not yet been well sorted out. All jurisdictions should take full account of these new circumstances, strengthen leadership, gain full understanding of policies, and handle properly the interests of the country, collectives, and individuals. This relates to the larger issues of further consolidation and perfection of agricultural

production responsibility systems, to the bringing into full play of peasant enthusiasm for socialism, and to work initiative among all rural villages next year.

Verification of output, earnings and expenditures is a prerequisite to year-end income distribution. Commune and brigade cadres must get over their fear of difficulties, eliminate obstacles, and adhere to the principle of seeking truth in facts in a real shouldering of responsibilities. Production teams practicing the assignment of full responsibility for task completion to individual households should use onthespot checking of output, centrally administered harvesting, weighing of threshed grain household by household, and figuring on the basis of representative samplings to arrive at output, earnings, and expenditure figures. They must distinguish collective output, earnings, and expenditures from the output, earnings, and expenditures of individual commune member farming. The collective's output, earnings, and expenditures are to include the products, earnings, and expenditures resulting from the growing of cash crops on land that the collective contracted out to commune members. Yields in excess of contracted amounts, and resulting additional earnings are not to be left out. Figuring of the price of commune member grain rations should be done on the basis of State Council Office document No 57 (82) titled, "Notice on Instructions Pertaining to Settlement in Terms of Centralized Procurement List Prices of Rural Commune and Brigade Distributed Grain." Except for individual provinces and regions in which the local situation requires maintenance of the status quo for the time being, "beginning this year, the price of grain distributed by collectives as well as of all grain withheld by collectives is to be settled on the basis of prevailing state centralized procurement list prices."

The honoring of contract agreements is a key link in good distribution of income. At the time of yearend income distribution, both parties are to abide by and live up to the contract agreements signed between production teams and contracting units (households, individual workers, or teams). All rewards must be issued, and all penalties levied in order to gain popular confidence. In cases in which contract provisions are not completely fair, experiences should be summarized and the following year awaited to make changes. When insurmountable natural disasters occur as a result of which a majority of commune members are unable to fulfill their contracted production tasks, following verification of the disaster situation by departments concerned, realities should serve as a point of departure for revision of contract production quotas and a readjustment of tasks in accordance with national policy provisions. Amendment of contracts should be done in accordance with party policies, so that house-

holds (individual workers, or teams) that actively fought the disasters with an investment of labor and funds will be assured a residue of output and their expenditures compensated, and so that households (individual workers, or teams) that did not actively fight disasters will be penalized. This way of doing things will help to stir future enthusiasm among the masses to fight against disasters and reap bumper harvests. In all cases in which human action has resulted in reduced yields, settlement is to be done on the basis of the original contracts no matter the size of reduced yield. If, after painstaking ideological education, "hard to deal with households" and "cunning households" persist in not honoring contract agreements, they should be severely dealt with on a case by case basis. Production teams may take back from them a portion or all of the fields for which they are responsible and, where circumstances are serious and an odious situation has been created, matters should be handled in accordance with law. Where contract provisions as originally set are not clear or precise, leading to disputes, cadres should mediate at once. After yearend distribution work has commenced, communes and brigades should organize forces to help some production teams clear up tag ends of summer contracts so that contracts will be fully honored for the year as a whole.

Accurate handling of the interests of the country, the collective and individuals is a principle of distribution work that must be respected. In production teams practicing full assignment of responsibility for task completion to individual households, the contracting households must strictly carry out provisions of agreements. They must promptly turn over grain, cotton, and oil to the state in fulfillment of quotas, and turn over withholdings to collectives to achieve a genuine, "tendering to the country, withholding of sufficient by the collective, everything remaining being one's own." In planning use of collective withholdings, generally a certain amount of accumulation funds should be used for agricultural capital construction and for development of agricultural sideline production under central administration of the collective. Production teams practicing centralized farming and centralized distribution should, first of all, pay agricultural taxes as policies provide, and should fulfill state procurement, assigned procurement, and excess procurement quotas for agricultural products. Where conditions permit, production teams should strive to make a greater contribution to the country. The amount of collective withholdings should be realistic. All production teams with increased output increased earnings are to insure that commune member income is higher than in previous years. No matter the form of responsibility system practiced, all loans are to be repaid the state. Production teams practicing assignment of sole responsibility for task completion to individual households may not "blow away" loans owing the state simply

because of readjustments in production relationships. Monies received from commune members for the turnover to them of draft animals and farm implements, as well as depreciation fees on collectively owned property turned over to commune members for longterm use should be deposited with accumulation funds and depreciation funds. Production expenses advanced by collectives are to be repaid in full by commune members (individual workers, or teams); such funds may not be apportioned or diverted to other used. In cases where improper methods have ben used to divide up state relief funds, collective accumulations, and various kinds of loans, education through criticism is to be done and matters resolutely righted. In some places today, problems have come about in which "both ends are full and the middle is empty," collective withholdings being a difficult problem. In most cases this is a problem related to poor performance. Some commune members have the right idea when they say, "Never mind the large withholdings; worry about having no where to turn," or "because withholdings were used properly in the past; today not a cent is owed." Consequently, in the course of yearend distributions of income, accounts should be figured accurately and an accounting published, and explanations should be given the masses as to just how collective withholdings were used during the previous several years. In this way the masses will have a genuine appreciation of the necessity for withholdings, and that they are related to their personal welfare, thereby actively fulfilling their task of turning over withholdings to the collective.

Proper arrangements are to be made to pay for labor by production brigade and production team cadres and personnel in all trades. Following institution of multiple forms of production responsibility systems, the principle to be used in handling problems of subsidies and bonuses to production team cadres should be arousal of the enthusiasm of both cadres and the masses alike and increasing cadre unity. Where cadre personal responsibility systems have been established and subsidization methods put into practice, methods already agreed upon should generally be honored. In cases in which subsidies and bonuses have been set too high, imposing too much of a burden for commune members, equitable readjustments should be made through mass discussion and consultation with cadres. Where no clear provisions have been made, discussions should be conducted at once to make them. Compensation to teachers in civilianoperated schools and for "barefoot doctors" should be decided fairly on the basis of policies. Payment and tonuses to persons engaged in farming, forestry, animal husbandry, sideline occupations, and the fishing industry should, insofar as possible, be generally equal, differences recognized, and more paid for more work.

Party and government policies relating to special care to

disabled servicemen, and to family members of revolutionary martyrs and servicemen are to be implemented. No matter the form of production responsibility system, special treatment is to be accorded to the families of martyrs and servicemen, and to the households enjoying the five guarantees [childless and infirm old persons who are guaranteed food, clothing, medical care, housing, and burial expenses by the people's communes]. This is a concrete embodiment of the superiority of the socialist system. It is also a new practice among China's peasantry that must be adhered to. When problems appear, they should be solved promptly.

In conjunction with yearend distributions, all jurisdictions should conscientiously check on the situation in implementation of Central Committee Document No 55 (79), and State Council Document No 162 (81). They should place great emphasis on the recovery from commune members of overpayments, and particularly on the recovery of sums owing by other units in an effort to recover more. When due dates have passed and no repayment made, they should proceed in accordance with State Council Document No 162 (81) to obtain repayment at stipulated interest rates to compensate the production team's losses. This work must be carried out under the personal direction of CPC committees and governments at all levels, cadres taking the lead in getting repayments.

..

This year's year-end income distribution work has wide ramifications, is very much related to policies, and entails much work. It is hoped that leaders at all levels, particularly county and commune leaders and vocational departments in charge, will genuinely intensify investigation and study, will summarize experiences, and will give tailored guidance. They should devote strict attention to the training of financial personnel, and to checking workpoint, property, and cash accounts in preparation for income distribution. They should use yearend distribution for a conscientious summarization and survey of the year's work, for further improvement in agricultural production responsibility systems, and to set the stage for achieving a bumper harvest in agriculture next year.

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STATE COUNCIL PROMULGATES PLANT QUARANTINE REGULATIONS

OW141211 Beijing XINHUA Domestic Service in Chinese 0721 GMT 11 Jan 83

[Text] Beijing, 11 Jan (XINHUA)--In an effort to prevent the spread of dangerous diseases, insects and weeds harmful to plants and to ensure safety in agricultural and forest production, the State Council promulgated the "Plant Quarantine Regulations" on 3 January and asked all provincial, municipal and regional people's governments and ministries, commissions and departments under the State Council to observe and enforce it.

The 20-article regulations contain provisions on the objects of quarantine, quarantine institutions, the designation of quarantine and protection areas, the quarantine of transported plants and plant products and actions to be taken against violations of the quarantine regulations.

The regulations say: Any kind of disease, insect or weeds occurring in a locality that is highly dangerous and can spread through plants and plant products should be the object of plant quarantine. A local area with plants under quarantine should be designated as a quarantine area to prevent the removal of quarantine objects from that area. When the quarantine area is large or when there are several areas under quarantine, areas where disease, insects or weeds have not occurred should be designated as protection areas to prevent the introduction of quarantine objects into those areas.

In its provisions concerning the quarantine of transported plants and plant products, the regulations emphatically stipulate: All kinds of seeds, nursery stock and other propagation materials must be quarantined before their transportation, regardless of whether they are on the list of quarantine plants and plant products or where they are to be transported.

The regulations stipulate: Seeds, nursery stock and other propagation materials that are introduced from abroad and may have hidden diseases or insects should be planted in isolation on a trial basis. They may be taken to other areas for planting after it is proven that they do not carry any dangerous disease or insects.

The regulations say: People who violate these regulations should be criticized and educated or given administrative discipline. People who cause losses as a result of their violations should be asked to compensate for the losses in consideration of the specific circumstances. People who violate the criminal code should be subjected to criminal proceedings.

RESPONSIBILITY SYSTEM SEEN AS EMBODIMENT OF UNITY OF OPPOSITES

Shanghai WENHUI BAO in Chinese 29 Oct 82 p 3

[Article by Lin Zili [2651 1311 0500]: "New Forms in China's Rural Socialist Cooperative Economy"]

[Text] Editor's Note: This is a fine article that explains the rural economic responsibility system. Though somewhat long, it makes good reading. The writer did a lot of investigation and research, and linked theory to practice in analyzing the existing and developing objective basis in China for agricultural contract responsibility systems linked to output. The article points out that in the socialization of agriculture there is no set offixed models, and that the contract responsibility systems linked to output that the broad masses of peasants in China have created through practice since the Third Plenary Session are new forms of a socialist agricultural cooperative economy that have demonstrated immense vitality in real life. We particularly commend this article to the readership.

The hammering into shape by experience of contract responsibility systems linked to output has brought them gradually to maturity, and put them on the path of steady development to make them a new form in the country's rural socialist cooperative economy of collective ownership. Their huge success has written an important chapter for the victory of the line of the Third Plenary Session of the 11th Party Central Committee. In his report to the 12th Party Congress, Comrade Hu Yaobang reaffirmed and explained them in the following way: "The establishment in rural villages during the past several years of multiple forms of production responsibility systems has further emancipated productivity, and this must be maintained for a long period of time. They may be gradually improved only on the basis of a summarization of the practical experiences of the masses. They may not be changed rashly in contravention of the desires of the

masses, much less can there be any backtracking."

The significance of explicitly noting that there can be no backtracking is extraordinarily important. This is because right up until the present time some people's doubts about the future prospects for contracting linked to output have not been completely eliminated. As a result of their former perceptions and conceptions, a substantial number of comrades have continued to feel that though contracting linked to output was necessary; still, it could be only a stopgap measure. They regarded it as a scheme that could not likely long endure much less be linked to the path of socialist agriculture. Consequently the backtracking issue had yet to be completely resolved in fact.

Further solution of this matter requires clarification of the historical necessity for contracting linked to output in the flourishing development of China's rural villages, and its essential nature as a new form in China's socialist agricultural cooperative economy.

Need to Understand Two Major Characteristics of China's Agriculture

The rise and rapid development of the contract responsibility system linked to output has been by no means accidental. One might say that it was inevitable. The basis for its existence and development is contained in the realities and the history of Chinese society. It differs from those rules and methods that rely on a definite structural form and are brought in from outside. It has grown out of the practice of 800 million peasants, and it has been summoned forth by the destiny of China's people.

Agricultural cooperativization transformed the individual economy of China's farflung rural villages into a socialist collective economy. This was of great historical significance. Following cooperativization, China's collective economy used the collective rural village system to a fairly large extent, principally in the following ways: (1) collective labor, and (2) "workdays," i.e., the workpoint system. Right after establishment of the collective economy, it was very natural to use such a system in view of the lack of experience. But with time, in the minds of the people it seemed to become a fixed model for socialist agriculture. Subsequently, though various readjustments were made, no fundamental changes took place at all in the collective labor and the workdays systems. The merits and demerits, advantages and disadvantages of the practice of such a specific economic form in other countries will not be evaluated here. However, it certainly did not fit in with China's circumstances, and it was not suited to China's agricultural situation.

The key to analysis of China's agricultural situation lies in understanding its two important characteristics. Let us first look at its first important characteristic. Over a fairly wide region, including certain areas in some provinces or even in numerous provinces such as in Guizhou Province or in Chuxian Prefecture in Anhui Province, which we recently surveyed, generally speaking there has been, first of all, very little socialization of production tools and equipment. Mostly plow oxen and hand tools are relied upon. In a small number of places having mechanized equipment, the equipment is mostly small in size (as, for example, hand tractors), and usually it is not part of a coherent system, being useable only in certain operations. Furthermore, the basic structure of all rural villages, including transportation and communications, is even weaker. The way in which roads, bridges, transportation vehicles, electric power grids, and communications are built and equipped is rather backward, and far from forming a transportation and conduction system that extends everywhere. Secondly, division of labor is very much undeveloped, and this is of significance on two levels. First is a single kind of economy, mostly the farming industry, with other things such as the breeding industry or the animal husbandry industry being substantially household sideline occupations. In few cases have they spun off to become a separate form of production. Next, within the farming industry, the entire agricultural process has been little divided up into various production stages or vocational links for which individual producers are specifically responsible. For example, in breeding, plowing, sowing, harvesting, and plant protection, links which could become specialized in view of progress that has been made with tools and techniques, specialization is rarely seen. Third, producers lack cultural and scientific knowledge, and organization and management skills. Illiteracy is still considerable among the peasants, and scientific illiteracy is even greater. New style peasants with an understanding of how to use advanced agricultural machinery and other production elements, and mastery of scientific farming and growing methods are in the minority. In planning production and organizing personnel, cadres frequently only "guess" on the basis of their experience. In culturally backward places, sometimes it is hard to find people qualified even to do the minimum amount of production planning or figuring of costs. Fourth, agriculture is characterized by the need for workers to care for whatever is being grown throughout the entire production process, care measures being adjusted on the basis of growth, reproduction, and natural conditions. In China, this is particularly the case. Since land is scant relative to population in most places, since cultivated land is limited and soil quality poor, and since the environment is nasty in many cases, farming has to be done intensively in China, and every effort made to increase yields per

unit of area. Thus, the care that laborers must give the object of their labors, as well as the independent decisions they must make on the basis of different circumstances, is of even greater significance in China than elsewhere.

Adoption of cooperative labors methods to meet the situation described above is not enough. Both grassroots level cadres and the masses of commune members know very well that individual family use of plow oxen and medium and small farm implements is required for decentralized, independent use, and that if it is insisted that these things be concentrated "in a large pile," that easily leads to poor feeding of animals or care of equipment for a decline in results obtained from using them. It results, as well, in a certain amount of inconvenience and waste. Inasmuch as division of labor is not very well developed, the need to establish cooperation on a foundation of division of labor is also very slight. If one is determined to practice cooperative labor, it will have to be only simple cooperation. Though classical writers have spoken of simple cooperation also being superior in some ways to working independently, they are talking about specific circumstances. Such circumstances also exist in China's agricultural production. By rush harvesting and rush planting, individual households can finish tasks on time with some difficulty. However, generally all that is necessary is a temporary mutual exchange of labor to solve problems; year-round simple cooperation is not required under most circumstances. Simple cooperation is different in nature than cooperation on a foundation of division of labor. It has existed for a long time in history, and it has not demonstrated any new productivity, nor does it a modern production method. This kind of cooperation concentrates peasants every day and provides no means whereby independent action can be taken on the basis of either the work that is being done or changes in the weather. All power of decision is frequently in the hands of a small number of cadres. When cadre organization and management skills are everywhere not high or even very low, it is hard to avoid "misguided direction," and "much thrashing around."

However, to come to the conclusion that China's rural villages must practice an individual economy is completely wrong. That is because the aforementioned circumstances represent only one major character of China's agriculture. There is also another major character, and that is as follows:

First, China's agriculture is a macrocosmic backdrop to the entire large national economic system. In urban industry, modern equipment already exists on a fairly large scale and in substantial amounts; both scientific techniques and organization and management have reached a certain level; and cooperation

on the basis of a division of labor is a socialized form of production. It must depend on agriculture for the supply of large quantities of grain and many raw materials, and it must establish close economic links with agriculture. This means that the state must exercise conscious and planned control not only over industry, but over agricultural production as well. Such close economic links and conscious control of production is, however, very difficult without the coordination of workers and cooperative economic organization.

Second, placement of the development of productivity in a fairly low stage is figured from the total situation. This is not to refute the facts given below. After 30 years of construction, China's rural villages possess some advanced production techniques as well as some persons skilled in techniques and management. Of course, they are not evenly distributed, and in places where levels are ordinary or backward, frequently they are somewhat scant to non-existent. However, in prosperous areas, it they are fairly easy to find. An example is on the Chiang Jiang-Han Jiang Plain in Hubei Province, which we recently surveyed. There the rural drainage and irrigation system is complete and large farm machines are also fairly numerous; the division of labor has developed to a certain degree, and outside of the farming industry, the breeding industry and some handicraft industries are operated not only as household sideline occupations but also gradually becoming independent industries in their own right. Within the farming industry, among production links such as water management, breeding, machine plowing and sowing, and plant protection, a trend toward specialization has also begun to appear. The spread of cultural knowledge and grassroots cadre administration and management skills have also reached a certain level. Thus, it has been necessary for collectives to institute centralized organization of cooperation on the basis of the specialization and division of labor in various production links. In addition, some cadres have been readied to undertake these functions.

Third, not only does China's agriculture rely on intensive farming and flexible measures for dealing with situations, but China's geographic position, its climate, and the history of its development going back thousands of years have resulted in China's agriculture being an irrigated agriculture over a considerable area. In many areas water conservancy is the life blood in the fight against frequently occurring drought, waterlogging, hail, wind, and insect pest disasters, and is crucial to the prevention of insect pests and diseases. This has meant a substantial job of farmland water conservancy capital construction for man-made improvement of production conditions, and it has required centralization in the use of certain production elements

for daily production, and centralized planning for certain production links, as for example the use of water and plant protection for which there is no alternative but centralization. The centralization of water use requires, in turn, centralized planning of crop varieties to be planted, and so on.

In a nutshell, the two major characteristics of China's agriculture have led to objective requirements of two kinds. One has been decentralized and independent work by individual peasant households, and the other has been state and collective control and coordination of the production process. The division of fields for individual farming and taking the road of an individual economy leads nowhere, of course. However, the rejection of decentralized, individual work, and sole use of concentration and centralization methods likewise does not fit in with China's circumstances.

A form of distribution corresponding to the concentration of labor is the workday and the workpoint system. Many years of practice have shown this system to produce poor results. No matter the kind of workpoints, "fixed workpoints," "a set amount of work points to be arrived at through evaluation of work done," "fixed workpoint quotas," or "Dazhai workpoints," none have worked very successfully. Fundamentally workdays or workpoints are for the purpose of evening out the work people do of different kinds, of different quality, and of different degrees of complexity and familiarity, turning it into a sort of abstract work that can be mutually compared, i.e., an abstraction that not only includes different kinds and different quality of work, but that also includes work under different material production conditions, with the use of an ideal thing that can express it quantitatively, namely money. The reason money is able to serve as a yardstick of value is that it is a valuable thing in itself, just as a yardstick is able to measure length because it possesses length itself. But workdays or workpoints can measure only the length of work time; they cannot express the actual amount of work provided, and they are particularly unable to express work quality. Since they have never been able to function as yardsticks but have served only as "chips," for comparative measurements of work, some other method is necessary. For a long period of time, the comparative measurement of work of different kinds and different quality in agriculture has been done in various ways. For example, one way has been to measure the amount of work a laborer can do (including conversion of quality to quantity) on the basis of his determined work capacity. Generally speaking, work capacity is figured on the basis of competence to do a certain kind of work. However, inasmuch as China's agriculture today consists principally of farming with very little division of labor, virtually every laborer can do every kind of farm work.

Since few kinds of work are specialized, figuring a person's work capacity has been simplified in terms of physical strength. It has even been simplified in terms of male workers, female workers, fully ablebodied workers, and semi-ablebodied workers. The way of arriving at "fixed workpoints" in many places has been the so-called "10 for men, eight for women, and seven for girls," or some similar method. Furthermore, work capacity is not the same thing as the actual amount of work done; as a result many places practiced "a set amount of workpoints to be arrived at through evaluation of work done." However, practice has shown that "evaluation" is difficult to do. Evaluation of work to record workpoints often produced all sorts of conflicts, and numerous people even felt fed up with this method. Yet another method was to set an average quota of workpoints for each kind of work, the actual amount of work being judged according to whether the work was completed, or completed under or in excess of quota. However, since China's agriculture today is substantially hand labor, and particularly since work conditions in agriculture are complex and ever changing in nature, equitable formulation of set quotas is difficult. For example, whether one plows the same land with a strong ox or a weak ox makes a great deal of difference. Using the same ox to plow different pieces of land, or plowing the same land after it has rained or when it is dry also makes a great deal of difference. So in formulating fixed workpoint quotas, there were numerous and endless considerations, which made the task extremely exasperating and complex. The peasants could not easily understand it, and since it is difficult to inspect farm work quality, even when workpoint quotas are equitable, the "fixed quota workpoints" system did not readily produce good results. Furthermore, since workpoints or workdays were only chips, when a peasant worked all he knew was how many workpoints he had; he did not know the actual value of the workpoints. As a result, when final settlement was made at the end of the year, any waste that had taken place in production, or excess amounts taken away by some cadres would be deducted from the value of a workday. This seriously impaired peasant enthusiasm for production and caused a lack of internal dynamism within China's agricultural production for a long period of time.

As regards concentration to carry out cooperative labor, as was said in the foregoing, under present circumstances, most cooperation in China's rural villages today is simple cooperation. According to Marxist theory, independent working, simple cooperation, and cooperative division of labor, etc are all forms of labor. Simple cooperation has existed for a long time historically, and is not a characteristic of socialist social labor forms, nor can it take the place of socialist production relationships. Similarly, workpoints and workdays as a tool for

measurement cannot take the place of socialist distribution forms; at least they are not a sole method for realization of distribution according to work. Consequently, to use a system of concentration of labor and workdays as a fixed model in socialist agriculture is a very great mistake.

The Nuclear "Contracting" in the Contract System Linked to Output is a Composite of Decentralization and Centralization

Socialist production relationships do not exist in a fixed mould. The system of concentration of labor and of workdays have been shown in practice to be unsuited to China's agricultural circumstances; thus new forms must be created to take their place. A responsibility systems in which contracting is linked to output is a new form in the socialist agricultural cooperative economy that has been created in practice by the broad masses of peasants. This form happily meets both requirements for decentralized independent labor, and centralized state and collective control over the production process, i.e., as is frequently said, it is both "decentralized" and "centralized." "Contracting," which is the nucleus of the contracting system linked to output, is a composite of decentralization and centralization; it links both decentralization and centralization very nicely.

"Decentralization" includes individual worker or household contracting of the farming of land. In general plow oxen and farm implements are turned over to individuals for their use, and day-to-day production tasks are carried out in a decentralized way, etc. This is the aspect of the contract system linked to output that is most readily observable, and it is also the one that differs most widely from the former collective economic model. As a result of the practice of "decentralization," the former set rules of concentrated labor were smashed, and along with them the specified conditions of "much thrashing around," and "misguided direction" they engendered also disappeared. Peasants could plan their day-to-day production as their numbers, their skills, and their customary practice dictated; they could independently take action to meet changing circumstances; and they could free themselves from apprehensions about things that required expenditure of much effort from which results were hard to see, and devote themselves to working with great enthusiasm. A single "decentralization loosened the peasants' hands and feet that had formerly been bound too tightly, and gave vigorous impetus to the enlivening and development of the rural economy.

A "centralization" corresponding to the "decentralization" is also an inseparable part of the contracting system linked to output. Though frequently not as noticeable as the "decentralization," its

actual existence and role it exercises are objective and lively, and also very much measurable. Generally speaking, "centralization" has two implications. Control over the production process is the first major implication of centralization; everything contracted has to be centralized in this way. In accordance with state purchase quotas and various needs of collectives, when cooperative economic organizations sign agreements with contracting peasant households, the contractor must produce a stipulated farm product to satisfy the terms of the agreement. In so doing, each individual working peasant's decentralized production process comes under collective control in fact, and thereby is controlled by state plan. The centralized use of certain production elements, or centralized arrangements for certain production links is the second major implication of centralization. There is a popular term about large scale assignment of responsibilities being "centralized in several ways," the several ways of centralization referring to this implication of centralization. Inasmuch as any large scale assignment of responsibilities will be centralized, or else it will not be large scale assignment of responsibilities, several centralizations are piled on top of the large scale assignment of responsibilities. The purpose of this is to emphasize that in addition to growing certain things in certain amounts, with withholdings and sales to the state all being regulated by contract agreements and restricted by the interests of the collective and the state, in the use of certain production elements and in arrangements about certain production links the collective exercises a greater function. Examples are centralized machine plowing, machine sowing, drainage and irrigation, propagation of seedlings, disease and insect pest prevention and control, and the breeding of new varieties, etc., centralized organization of investment when required, conducting agricultural capital construction, and coordination of the expansion of reproduction links.

In essence, even if only the first layer of centralization existed, the system would be different in character from the division of the fields for independent working. With institution of the second layer of centralization, the substantive economic position and function of the cooperative economic organization is doubtlessly even more apparent. Though decentralization of labor and independent working gives somewhat of a free hand; nevertheless, by adhering to centralization in this regard, control will not be lost over the economic activities of the masses of contracting peasant households, and implementation of both state and collective economic plans may be assured.

Linking of the Calculation of Compensation to Output Is a Manifestation in the Form of Distribution of the Unity of Decentralization and Centralization

The unity of "decentralization" and "centralization" in the form of distributions is in the linking of the calculation of compensation to output. Contracting is the premise on which the linkage to output is founded; without contracting, there can be no linkage to output. This is very clear. Without the decentralized use of material production conditions and working independently, it would be impossible to determine who produced the most products and who produced the least, and linking compensation to output could not be done. At the same time, contracting must be linked to output. Without a link to output, there could be no contracting. This is also very clear. If material production conditions were used in a decentralized way and work done independently with output not being used as a basis for figuring compensation, but everyone continuing to eat out of a large common pot instead, contracting would have no real meaning. Therefore, the linking of the figuring of compensation to output is a necessary accompaniment to the contracting system to take the place of the workday system.

The writer believes that the "linking of compensation to output" is a figuring of compensation on the basis of "standard output." Standard output is, in reality, the average amount of labor that must be expended to farm a contracted mu of land in a cooperative economy. Inasmuch as everybody is equal within a collectively owned cooperative economy in the quantity and quality of land they contract to farm under the contract system, , and since the amount of funds invested in the land is also largely equal, the effects of the land and of funds on output may be ruled out, and thus labor (which naturally includes administration) becomes the sole factor deciding output. Those this is not completely accurate inasmuch as the investment fund factor cannot actually be completely ruled out; nevertheless, in a collective economic organization that extends credit and helps the poor, the amount of funds invested (the amounts individually possessed) by each contractor, and particularly the amounts invested in a contract economy (the individually operated economy outside the contract economy excluded) generally correspond to the contracted acreage and are equal. Standard output differs from both workdays and workpoints. It is an objective yardstick in and of itself. It uses neither "evaluation" nor does it require labor quotas. All that is necessary is for contractors to compare their actual outputs with standard outputs Supposing two contracting households each contract for 10 mu of land of equal quality, and labor on it equally, namely for 500 man-days, but their actual output differs, the one being more than the standard output and

the other being less than the standard output. This shows that the first one worked and managed better while the second one put in somewhat less effort. In addition to obtaining standard work compensation for standard output (minus collective withholdings and state agricultural taxes), the first one would also receive compensation for production in excess of the standard, i.e., excess labor compensation. The second one would not only not receive excess labor compensation, but would also not get compensation for standard labor. Each of the contractors compared his actual output with the standard output. Conversely, in terms of the cooperative economic organization, this meant use of a centrally formulated standard output for each contracted piece of land, and a centralized measuring of the work of each contractor as a basis for determining the contract income of each contractor. Therefore, a look at the situation shows that when large scale contracting of responsibilities is used as the model for directly relating calculation of compensation to output, that means that each peasant household will individually get the products from the land whose farming it contracted, and that after "completely satisfying state requirements and collective withholdings, all the remainder is its own" It appears that centralized collective distribution does not exist. However, this situation contains within it a standard output centrally formulated by the cooperative organization, and it also judges the amount of labors done by each contractor, which is centralized distribution in essence. This shows that any supposition that large scale contracting of responsibilities as a model for directly relating the calculation of compensation to output has eliminated centralized collective distributions, and that there is only "decentralization" but no "centralization" does not accord with the facts. The principle of the unity of "decentralization" and "centralization" permeates the entire production and distribution process in the cooperative economy of linking output to contracting.

To be sure, as was said in the foregoing, the linking of output to calculation of compensation is founded on the equality of the land contracted for farming and the use of funds on it, but this equality is not absolute. Specifically, the effect of funds invested on actual output and earnings cannot be discounted. Therefore the contract earnings of each contractor contains a little something that is not the result of his labors, which is the material production situation factor. However, in modern socialist practice, distribution according to labor cannot be pure and precise. Its realization cannot be total and complete, but only approximate. This is true of the wage system in the state farm economy, and the linking of compensation to output in the collectively owned cooperative economy must also be this way. It may be stated with certainty, however, that as compared

With the system of distribution according to workpoints and workdays, calculation of compensation according to standard output is much closer to distribution according to work.

Completion of the great cooperativization of agriculture lies more than 20 years in the future. During the same not inconsiderable period of time in the past, China's socialist agriculture went through many twists and turns, finally entering the new stage of an agricultural socialist cooperative economy dominated by contracting linked to output. Much may be said about the substance, characteristics, and the different methods used in the contract system linked to output. It is truly also an extremely rich and moving economic experience requiring analysis and portrayal from all sides and at all levels. However, when all is said and done, the heart and soul of the contracting system linked to output is the unity of decentralization and centralization. Perhaps when looked at in a gross way this is nothing remarkable; but it is just this sort of new form that has never been "known" before and that has struck deep roots in China's farflung rural villages that has splendidly undergone the hammering and cleansing of practice to become mature day by day. Naturally, its linking to specific times, methods, and measures cannot yet be considered complete. However, as a general basic principle, its significance is great and far reaching. It has played an irreplaceable role in bringing about a new situation in the rural economy in recent years. One may be confident that with the development and expansion of this aforesaid situation, the new situation in China's cooperative economy of socialist collective ownership will show itself more and more and gain further recognition by history.

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PEARL RIVER DELTA COMMODITY GRAIN BASE PROSPECTS EXPLORED

Beijing NONGYE BUJU YU QUHUA [AGRICULTURAL DISTRIBUTION AND ZONING] in Chinese Mar 82

[Article by Wu Youwen [0702 6735 2429], Geography Department, South China Teachers Training College: "Exploration of the Building of a Pearl River Delta Commodity Grain Base (Excerpts)"]

[Text] 1. Bases and Criteria For Building Commodity Grain Bases

By so-called "commodity grain bases" is meant grain producing areas with large output and a high commodity rate that are able to provide concentrated and large amounts of commodity grain. Such places have outstanding conditions for development of grain production, and are usually able to use their productivity more equitably to increase the country's economic strength. By increasing their labor productivity rate, it is possible to produce relatively large amounts of grain with a relatively small social expenditure, the better to satisfy the national economy's grain needs.

1. Basis For Distribution of Commodity Grain Bases

Commodity grain bases are a specialized form of production that meet the requirements of the laws of planned proportional development of the national economy, that grow out of the possibilities an area's natural and economic conditions offer, and that develop from a deepening of the social division of labor and commodity relationships. They exert a profound and progressive influence on the development of agricultural production. The principal bases for the building of commodity grain bases are as follows:

(1) A linking of national economic development requirements with specific conditions in an area and its foundation for production. National economic development requirements include both national and local requirements. This is one aspect. However, in order to determine ability to satisfy these requirements, it is necessary to take a look at just what the specific situation in an area is. Only when an area's specific conditions and foundation for production permits is it possible to carry out effectively an

equitable division of work in the labor field to build a grain production base of a certain size.

(2) Quantity of commodity grain must be linked to the consistency with which grain is produced. Generally speaking, how much commodity grain is produced is related directly to the consistency with which the base produces, and has a very great effect on development prospects. One can also see additionally that in the selection of a base consistent output will be an important factor in gauging whether to build. So-called consistent output includes the existing basis plus the amount of increase resulting from the process of development. This is to say, it will be determined both by people's ability to use and control natural conditions and by the level of intensivity. Thus, intensification of farmland capital construction, steady improvement and perfection of production conditions, rational reform of the farming system, practice of scientific farming, and fully effective exploitation of the land's potential, thereby steadily increasing the level of production, are all important ways and means of increasing the consistency of production.

2. Criteria for Commodity Base Counties

We believe the following several criteria should be considered in the selection of commodity base counties:

(1) Fairly high commodity grain rate. Size of commodity rate is both an important indicator of the degree of specialization and an important criterion in whether a place should be selected as a commodity grain base. This is because the higher the commodity rate the greater the contribution to the country. This is the fundamental goal in the selection and construction of commodity grain bases. However, under present circumstances in which the levels of grain production are not high and the amount of grain produced per capita of agricultural population is not great, just what should a county's regular annual commodity rate be in order for it to be selected? A look at the actual situation in the Pearl River Delta shows it should be more than 20 percent in order to be selected as a "base county."

(2) Fairly large amount of commodity grain. The amount of commodity grain that a "base county" provides annually is likewise an indicator for judging the size of its contribution to

* Regular annual commodity grain rate = Difference between state procurement and sales (amount of state procurement - amount sold back to villages)/gross output of grain.

the country. A look at the situation in the Pearl River Delta shows that when each base county is able regularly to provide more than 70 million jin of commodity grain annually, it is suitable. However, this criterion is variously influenced by the cultivated land area in each county and the size of population, so it may be used only for reference.

(3) Fairly high average amount of grain per capita of agricultural population. The average amount of grain produced per capita of rural population both reflects the plentifullness of grain in a base county as well as the labor productivity rate. It is a direct factor in determining size of the commodity rate. When the amount of grain per capita of agricultural population is small, there is no use to even talk about providing commodity grain, of course. Thus, a certain average amount of grain per capita must be provided in addition to the amount consumed (for food, for seeds, for livestock feed, and for reserves) before commodity grain can be provided. In terms of current levels of production, an average of more than 1,000 jin per capita of agricultural population per year is necessary.

(4) Fairly large wetland area and area sown to paddy rice, and fairly large amounts of wasteland suitable for agriculture or sea spits that can be reclaimed for agriculture within a short period of time. In base counties, the wetland area should be about 80 percent of the total cultivated area, and the area sown to paddy rice should be about 70 percent of the total area sown to grain. In addition, the soil's potential should be fairly great. Given the present state of land resources, in base counties the cultivated land area should be about 1.5 mu per capita of agricultural population, or else the amount of wasteland that can be reclaimed for agriculture (including the amount reclaimed from bodies of water) should be substantial so that the amount of cultivated land will amount to more than 1.5 mu per capita within a short period of time.

On the basis of these criteria, though no individual county completely meets requirements, it is necessary to proceed from the requirement that base counties provide continuous tracts of land insofar as possible, and consideration should be given to making them a part of a "commodity grain base."

2. Analysis of the Pearl River Delta Commodity Base

1. Conditions For Building a Pearl River Delta Commodity Grain Base

Administratively the Pearl River Delta encompasses 27 counties (or districts), and municipalities covering an area of somewhat

more than 360,000 square kilometers.* At the end of 1977, its population totaled 14 million (not including municipal Guangzhou), more than 11 million of which was farming population. The delta's cultivated land amounted to 33.3 percent of the total for the province as a whole. Its wetland area was 30.5 percent of the province's total. In 1977, grain yields averaged 1,030 jin per mu; grain output accounted for 33.5 percent of the province's total; and state grain procurement here amounted to 48.5 percent of procurement in the province as a whole. The commodity rate was 37 percent, an average of more than 300 jin of commodity grain per capita of agricultural population.

The Pearl River Delta also has a great potential for development of cash crops, silkworm mulberry fruits, aquatic products, and livestock. In addition it faces the South China Sea and is close to Hong Kong and Macao, outstanding conditions for the development of foreign trade and tourism. In 1977, it accounted for 60 percent of the province's sugarbeet output, 93 percent of the province's mulberry cocoon output, 30.8 percent of the province's aquatic products output, 70 percent of the province's fruit output, and 45 percent of the province's gross value of agricultural sideline product exports. Additionally, the delta's industry and water transportation is well developed; gross output value of its industry is two-thirds the provincial total; and it stands first in the province in inland river shipping, its annual volume of goods shipped by water being 72 percent of the total for the province as a whole. Therefore, the Pearl River Delta is not only a major commodity base for agricultural sideline products such as grain, sugar, silk, fruit, aquatic products, and livestock products, it is simultaneously also an important industrial, shipping, and foreign trade base within the province.

The Pearl River Delta possesses outstanding natural conditions and socio-economic conditions for the building of a commodity grain base.

The Pearl River Delta is one of the largest plains in China's southern sub-tropics. It has a wealth of products, a flat and low-lying terrain, a crisscrossing of rivers, and has islands

* Of the 27 counties (or districts) and municipalities, the suburbs of Guangzhou, Huangpu District and Huizhou City, Zhaoqing City, Foshan City, Jiangmen City, Zhuhai City, and Shunde County are not suitable as "commodity grain base counties." They may only be grouped together in accordance with the requirement for continuous tracts. Actually only 19 counties can be "commodity grain base counties."

and hills here and there. The entire plain tilts slightly in the direction of flow of its rivers. After the main arteries of the East, West, and North rivers flow into the delta, they branch more and more as they head toward the lower reaches. The major arteries divide, combine, and intertwine like a network, presenting a panorama of a marshy land of rivers and lakes. The cultivated land is concentrated in continuous strips; the soil is fertile and its effective fertility high; and most of the soil is deep, soft, friable, and rich. The silty fields that have been reclaimed from bodies of water are particularly so. This is the area in which the consistently high yield farmland area is greatest, and cropping most concentrated. In addition, because of the huge amounts of water and silt brought down from the upper reaches of the West, North, and East rivers, silting occurs very rapidly at all exits into the sea, and spits emerge from the water. The delta is steadily extended seaward. At Hongqili and Jiaomen, where rivers enter the sea, the land is extended 100 meters annually. At Denglongsha in Modaomer, it is extended 150 to 170 meters per year. Such copious silting is a major source of silt for the sandy field areas. It has been estimated that 42 percent of all the province's sea shallows have been reclaimed from the sea within recent times, and these are major growing areas for rice and various tropical cash crops in the province.

Since the Pearl River Delta lies to the south of the Tropic of Cancer, is located at a low latitude, faces the sea, receives powerful radiation from the sun, and has abundant heat, its summers are long and its winters short; its growing season is long; the number of its frosty days are extremely few and its frost-free period is long; its rainfall is copious, and crops get all the moisture they need. Here the sun shines between 1,900 and 2,200 hours each year, and annual solar radiation totals 120 - 130 kilocalories per square centimeter. This is the region of Guangdong Province with greatest sunshine and strongest radiation. Annual temperatures average 21-23 degrees centigrade, and July and August are the hottest months (temperatures during July averaging more than 28°C). Between December and February it is chilly, but temperatures are still above 10°C (in January, temperatures average from 13°C in the north to 15°C in the south), and crops can grow the year round. Cumulative temperatures from days when the average temperature is greater than 10°C are 7458 - 7589 C, and last for 310-360 days. The safe growing period for paddy rice is 220 - 250 days, and the growing season for sugarcane is 300 - 340 days. The weather favors growth of crops that like high temperatures such as paddy rice, sugarcane, silkworm mulberry, jute, and sub-tropical fruits. Therefore, the long farm crop growing season makes it the crown among the country's three deltas. However, during winter and spring when cold waves strike it may be sharply chilly for a short period of time, and this

poses a threat to winter growing sweet potatoes, to the early rice crop, and to sugarbeets, sub-tropical fruit trees, and fish fry. Because of the influence of warm, moist ocean air masses, annual rainfall is abundant, averaging 1,600 - 2,000 millimeters per year, and areas along the seacoast or on the windward slopes of hills may get more than 2,000 millimeters. Since the flow of air masses differs from season to season, the distribution of the rainfall is uneven, 80 percent of the total for the year falling between April and September. Most of this is in the form of torrential rains of great intensity, and should a tidal wave occur, a flood and waterlogging disaster frequently ensues. By contrast, during the spring months rainfall is scant and may vary greatly in amount; drought disasters may occur. As a result, much effort has been spent on construction of farmland water conservancy projects, which have been an important action promoting the development of agriculture in the delta.

In the Pearl River Delta, labor resources, farming skills, the level of mechanization, and economic links between cities and countryside are superior. First comes the abundant labor resources and the high level of farming skills. The Pearl River Delta has a huge population distributed densely, averaging more than 380 people per square kilometer. On plains areas in the delta, the average is almost 1,000 per square kilometer. The peasants have high farming skills and abundant experience in production. Second is the fairly high level of agricultural mechanization. The Pearl River Delta's agriculture is the most highly mechanized in the entire province. Back in the 1960's, it expanded a large electric power grid and build electric drainage stations. Next it added a large number of new type tractors of various kinds, dredges, axial-flow pumps, threshing machines, and processing equipment, the area's agricultural mechanization thereby reaching a fairly high level. Third is the close economic relations between cities and countryside, and the development of agricultural product processing industries. The Pearl River Delta is crowded with cities and towns, and the economy is prosperous. Development of agriculture is much affected by Hong Kong and Macao. There is much specialization in the growing of farm crops and many commodity crops are produced. Since small cities, towns, and markets are widely distributed throughout the area, the farflung rural villages are close to farm machines, chemical fertilizers, pesticides and technical assistance in cities and towns, and they can sell farm products in the markets. In addition, the development of farm product processing industries and foreign trade has helped development of commodity production.

2. Regional Types of Commodity Grain Bases in the Pearl River Delta

The structure of agriculture in the Pearl River Delta is fairly complex and regional distinctions apparent. Looked at in terms of requirements for grain production, the delta may be divided into three distinct types as follows:

(1) The high rice yield type of delta silt fields reclaimed from bodies of water. This type is located in the counties in the delta area from Sanshui to Shilong to Yaimen. The fields reclaimed from the water are crisscrossed by rivers. Cities and towns crowd the land; the population is large; the workforce is copious; water and fertilizer is abundant; the farmland area that produces consistently high yields is large; and yields per unit of area are high. The broad alluvial plain around Dongguan, Shiqi, Xinhui and close to Guangzhou, in particular, is a major rice producing area. This area accounts for more than 40 percent of all grain grown in the Pearl River Delta, and about 50 percent of the commodity grain. Its commodity grain rate is about 40 percent, an average of 400 jin per capita of commodity grain. It is this area of Guangdong Province that has historically supplied the most commodity grain.

(2) The type in which early crops predominate in areas along the lower reaches of the rivers. This type is located in the lower reaches of the East River and its estuary called the Xizhijiang Basin, and at the point of confluence of the West, the North, and the Sui rivers. Here the terrain is low-lying; the low-lying land holds much water; there are numerous drowned fields; labor is short; farming is done crudely; yields are inconsistent; early crops predominate, and the land utilization rate is low. However, much wasteland is suitable for agriculture, and the potential for increased yields is great. This area's total grain output and commodity grain output both amount to about 20 percent of the delta's total. It has a 30 percent commodity grain rate, an average of about 300 jin per capita of commodity grain being provided. It is the area in the province with the greatest future potential for supplying commodity grain.

(3) The double rice crop type in the valley plain along the rivers. This includes the two large tracts of the Tan River Valley and Liuqi River, and the Zeng River Plain. The Tan River basin is famed as an overseas Chinese village whose levels of agricultural production are low and conditions fairly poor. Because the Liuqi River and the Zeng River Plain are close by Guangzhou, and their production conditions relatively good, it's agriculture is that of a distant suburb. Grain output from this region amounts to about 30 percent of the Pearl River Delta

total, and it provides more than 20 percent of the commodity grain produced in the delta, the commodity grain it provides amounting to more than 300 jin per capita. Because of its proximity to Hong Kong and Macao, and because it is an overseas Chinese village, it has a high level of grain consumption and large needs. Historically it has been a major grain producing area in the province.

3. Further Intensification of the Building of a Pearl River Delta Commodity Grain Base

The Pearl River Delta, which has historically been a major commodity grain producing area of Guangdong Province, is also a major commodity grain base for the country as a whole. As a result of 30 years of building since Liberation, a fairly good foundation has been laid for development of agricultural production. Nevertheless, the basic conditions of agricultural production today are still a long way from meeting needs for a high production commodity grain base. For further development of grain production, attention must be devoted to the following major measures:

(1) Further attention to farmland capital construction centering around water control. The major problem in the Pearl River Delta today is the great threat that flood and waterlogging disasters pose, and the principal obstacle is a high water table. Consequently, the crux of farmland capital construction lies in effecting a permanent cure for flooding and waterlogging disasters through lowering of the water table. Specifically, this means solution to the problems of impounding water in the upper reaches, and bringing the river under full control in its mid-reaches at Dalianwei and Koumen. Right now, most important is widening at Lianwei and dredging of the drainage and irrigation system, increasing electrical pumping drainage capacity, and lowering the water table to meet requirements for high yields.

(2) Rapid upgrading of the level of scientific farming centering around a restructuring of the farming system. Practice has shown that a rational farming system makes full use of light energy during all four seasons, uses the entire year's photosynthesis potential, increases the land utilization rate and increases the multiple cropping index, and employs crop rotation, intercropping, and interplanting to extend the farming season and to avoid damaging weather. The prevailing farming system in the Pearl River Delta is one of three crops a year in which principally rice is grown during spring, summer, and autumn (March-November), and mostly dryland crops are grown during winter (December-February). This farming system has to continue to develop in order to make the most of potential for increased yields, and to

increase outputs for the year as a whole. Moreover, active use of summer's light and heat to develop the growing of intermediate rice is also an important way in which to increase yields. The positioning between winter and summer of intermediate, early, and late rice crops is a way to use the photosynthesis potential of this time. Though photosynthesis potential is small in winter, thermophilic crops can overwinter, and high yields may be obtained from potatoes and wheat.

(3) A build up of fertilizer, principally the use of barnyard manure. First, hog raising must be emphasized. Second, large scale growing of green manure should be done. Finally, large quantities of mud fertilizer should be used. The Pearl River Delta has plentiful mud fertilizer resources. Use of dredges to blow the mud up to the fields would both raise the height of the silt fields while lowering the water table, and would also improve the soil and increase its yields.

(4) Rapid increase in the level of farm mechanization. The first requirement is genuine solution to the problem of producing and supplying spare parts to repair existing farm machines. The second requirement is increase in mechanized equipment. The third requirement is manufacture of farming boats. Farm boats are an extremely important piece of equipment for production and for use in daily life in the delta. They are needed to get mud, for transportation, to ship grain, to get to work, to fight floods, and to make rescues. Effect measures to build farm boats is a priority matter of the moment for production in the delta.

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CROPPING PROBLEMS IN BUILDING HUAIBEI GRAIN BASE EXAMINED

Beijing NONGYE BUJU YU QUHUA [AGRICULTURAL DISTRIBUTION AND ZONING] in Chinese Mar 82 pp 188-193

[Article by Gao Benhua [7559 2609 5478], Geography Department, Anhui Teacher Training College: "Problems With Crop Mix and Crop Patterns at Huaibei Commodity Grain Base in Anhui Province"]

[Text] A rational crop mix and rational crop patterns are problems that must be considered first in the building of the Huaibei Commodity Grain Base. This problem relates to the quantity and quality of commodity grain provided the country; it relates to concurrent concern for the country's economic construction and the needs of the broad masses of people for production and daily life; it relates to the all-around and correct carrying into effect of a program for "taking grain as the key link, comprehensive development, adaptation of general methods to specific situations, and proper concentration;" it relates to full and rational use of land resources and realization of a rational regional division of labor in agricultural production; and it relates to the linking of soil use and soil nurture, so that the soil will become more fertile the more it is farmed and so that continued all-around balanced increases in yields from agricultural production will be assured. Therefore, building of the Huaibei Commodity Grain Base requires, first of all, the determination of a rational mix between major commodity grain crops and all other kinds of crops to be provided the country, and determination of the proportional area to be planted to various farm crops, a rational crop rotation system, as well as the spacing of crops and zoning of the crop growing area.

1. Basic Conditions and Increased Yield Potential From Building of the Huaibei Commodity Base

The land area of the Huaibei region of Anhui Province is approximately 38,300 square kilometers, most of which is plains accounting for more than 95 percent of the land area. This provides extraordinarily favorable conditions for complete mechanization and large scale farming on continuous tracts, and for a rational

layout of agricultural production patterns. However, a part of the Huaibei Plain is not at all flat, so the situation is "mostly flat, but slightly not flat," which affects cultivation and irrigation.

The Huaibei Plain has a temperate zone monsoon climate in which winters are fairly cold and dry with little rainfall. By contrast, summers are hot with much rainfall. Precipitation averages 750-900 millimeters annually, and the average annual temperature is 14-15°C. Less than 15 days have a daily average temperature of less than 0°C. Crops rarely suffer from freeze damage, and crops such as wheat can generally safely overwinter. This area north of the Huai has 200-220 frost-free days each year, and the sun shines about 2,200-2,500 hours, or between 50 and 60 percent of the time, which is more than elsewhere in the province. Cumulative annual temperature for days on which the daily average temperature is above 10°C is 4,500-4,900°C in the Huaibei area. Clearly, heat and sunshine conditions in the Huaibei area are relatively favorable for agriculture, and two crops a year may be grown. A single problem is the slightly inadequate amount of rainfall, but the amount of precipitation varies greatly from one year to another and its distribution from month to month is also very uneven causing frequent drought and water-logging disasters.

The Huaibei area has numerous kinds of soils. Most important is black gritty soil, which covers half of the total Huaibei area, and is distributed principally on the Hejian Plain. Second is sandy silt soil (including sandy soil, puddly soil, and mixed clay and sand), which is found over about one-third of the Huaibei area and is distributed principally in northern Huaibei and along both banks of rivers in recent Yellow River flood plain alluvial areas. Other soils include yellow slope soil, yellow belozem, and paddy soil, which are distributed mainly on terraces (hills) along the Huai River. Additionally saline-alkaline soil is found in scattered patches in northern Huaibei and in lowlands in the central part of the Hejian Plain. In most places in Huaibei the soil is fairly thick, but much of the black gritty soil contains a layer of gravel, which rules out deep plowing or deep turning of the soil. Except for the mixed clay and sandy soil, and the puddly soil, most of the Huaibei soil is not very fertile; its organic and nitrate content is relatively low, its structure poor, its plowability fair, the period when it can be plowed short, and its ability to retain fertilizer and water weak. The black gritty soil is the low yield soil that covers the largest area.

Despite the less than ample sources of water for irrigation in the Huaibei area, neither surface water nor ground water have

...een fully used or developed. It has been preliminarily estimated that more than 8 billion cubic meters of surface water and ground water is available for use in the Huaibei region, and that a farmland area of about 20 million mu could be irrigated. Since Liberation, large scale farmland water conservancy construction has been done in the Huaibei region for good results. The former situation of "large disasters from large rainfalls, small disasters from small rainfalls, and drought disasters from no rainfall," has been turned around.

The cultivated area of Huaibei amounts to about 33 million mu. This is 60 percent of the region's total area, or close to half the province's total cultivated area. Cultivated land amounts to 2.2 mu per capita of farming population, slightly more than 1/2 mu more than the average for the province as a whole. On the broad Hejian Plain in the middle of the Huaibei region, population is small relative to available land, the amount of cultivated land averaging more than 3 mu per capita. In the vast region north of the Wo River and south of the Xinbian River, as well as in the low-lying areas along the Huai Lake, population is scant relative to land and, in many communes and brigades there is no less than 4 or 5 mu of cultivated land per capita, and as much as 7 or 8 mu, or sometimes more than 10 mu. Much of the cultivated land here is not used to the full; farming is not intensive, and mostly a single crop per year (wheat followed by a sunning of plowed fields) is grown from which yields per unit of area are low. The area in Huaibei that lies fallow throughout winter is very large, at least 13 million mu at the present time. An additional more than 5.5 million mu is plowed land being allowed to sun. The multiple cropping index is not large. In 1977, the multiple cropping index was only 152 percent, between 20 and 30 percent less than during the period of the first 5-year Plan. In the Huaibei region there are wide wasteland areas that could be used such as earth embankments along canals and rivers, abandoned ditches, low-lying land near lakes and rivers, saline-alkaline land, odd bits and pieces of land, and worn hill slopes. Farm departments estimate the amount at more than 1 million mu. It has been estimated that the actual cultivated land area in Huaibei is greater by 10 to 15 percent than reported statistics (33 million mu). The foregoing shows clearly that land use potential is very great for the building of a commodity grain base in the Huaibei region.

Farm crop yields per unit of area are fairly low today in Huaibei, and the potential for increase is very great. In 1977, grain crop yields averaged 230-odd jin per mu in terms of area sown, which was 100 jin lower than the average for the province as a whole. In terms of area cultivated, grain crops yields were only 360-odd jin per mu, almost 200 jin lower than the average

for the province as a whole. [Area sown being greater than area cultivated as a result of multiple cropping.] Cotton yields averaged only 34 jin per mu, 16 jin lower than the provincial average. Consequently, it will be necessary to increase both grain yields per unit of area and labor productivity rates if the area is to provide the country with greater amounts of commodity grain and gradually come to play a role as a base.

2. Rational Mix and Distribution of Farm Crops

In view of the need to develop the national economy and raise the local people's standard of living in order to assure that good variety, high quality commodity grain will be provided the country in large amounts; in view of the need for correct implementation of the program of "taking grain as the key link, comprehensive development, adaptation of general methods to specific situations, and proper concentration," and carrying out of the principle of a rational regional division of labor in agricultural production; in view of the principal conditions of local growth in Huaibei region farm production, and the production situation and potential for increase of major farm crops; in view of the history and current state of farm production in Huaibei, and the representative experiences of some communes and brigades there; and in view of rough analysis of requirements and capabilities for fully rational use of land resources, institution of a scientific rotational farming system that combines use and nurture of the soil, and expansion of the multiple cropping system, the following should be done about a rational crop mix and rational crop patterns in the Huaibei region: Wheat should be the principal crop grown, and the corn growing area should be expanded through gradual reduction in the ratio of the presently overly large sweet potato growing area, and through adaptation of general methods to local situations for the growing in some areas of grain crops such as paddy rice. The growing of cash crops should be revived and developed principally soybeans, but also cotton, sesame, and flue-cured tobacco. A two crop per year or three crops every two years system should be gradually put in place in which winter wheat followed by soybeans predominates. Winter wheat can be rotated with green manure, peas, and rape. Soybeans and corn, sweet potatoes, sesame, flue-cured tobacco, and ambari hemp can be rotated or intercropped. Spring cotton may be rotated with spring gaoliang, spring sweet potatoes, and spring corn, with green manure either grown as the previous crop or interplanted with the crops in the same season to achieve a combination of soil use and soil nurture. In laying out crop patterns, concentration should be done area by area as explained below.

Huaibei area wheat production holds and extraordinarily important

position in the province. Huaibei is the province's major wheat producing area, accounting for two-thirds of both the province's growing area and output. Wheat is also the most important grain crop in the Huaibei region. Formerly it annually occupied more than 60 percent of the region's cultivated land area, and more than 50 percent of the area sown to grain crops. The year's wheat production had major effect on agricultural production for the year as a whole. According to sayings, "when the summer crop augments the autumn crop, there is a bumper harvest for the year as a whole; but when the autumn crop augments the summer crop, hopes are not great," and "One wheat crop makes up for all the plowing, sowing, and harvesting."

From June to September it rains a great deal in Huaibei, and waterlogging disasters are common, particularly in low-lying land. Most of the wheat is harvested in early June, so it escapes the summer waterlogging; thus, the summer wheat is more likely to escape disasters than autumn grains. Wheat has always been the main crop around which all others were planned in the Huaibei farming system, and it has been the leading crop in either a system of three crops every 2 years or 2 crops every year in Huaibei. More planting of wheat in Huaibei could reduce the amount of ground allowed to lie fallow during winter, could help increase the multiple cropping index, and could set the stage for fully rational use of land resources.

Ever since 1958, however, the area planted to wheat in Huaibei has steadily decreased. In 1977, the Huaibei wheat growing area was 10 million mu less than in 1957, accounting for only 51 percent of the cultivated land area and 46 percent of the total area sown to grain crops. Therefore, building of the Huaibei Commodity Grain Base will require expansion of the wheat growing area until it gradually comes to occupy more than 65 percent of cultivated land and the wheat growing area is about 1.3 mu per capita of farm population. Today, wheat yields per unit of area are very low in Huaibei averaging only 120-odd jin per mu. Total wheat output amounts to only 26.3 percent of total grain output. Therefore, while expanding the wheat growing area, it is necessary also to raise wheat yields per unit of area quickly. Following several years efforts, wheat yields in Huaibei should gradually increase to more than 500 jin per mu or even to about 800 jin per mu, wheat thereby accounting for between 50 and 60 percent of total grain output. (Xiaozhangzhuang Production Team in Xieqiao Commune, Yingshang County, which is located in the back gritty soil region, grew wheat on a 240 mu area in 1977, or 75 percent of its cultivated land, from which it harvested an average 804 jin per mu or 1,251 jin per capita of which 450 jin per capita was commodity grain. There are quite a few such representative production teams in Huaibei).

Sweet potatoes hold second position in area sown to grain crops in Huaibei, and they hold first place in output since the area's output of sweet potatoes is much greater than wheat. In 1977, the sweet potato growing area was 27 percent of the total area sown to grain crops, an 84 percent increase since the period immediately following Liberation (the spring sweet potato area amounting to 56.7 percent of the 84 percent total). Sweet potato output accounted for 47.3 percent of total grain output, which is clearly somewhat too much. At the present time, sweet potatoes are not only the main grain in the farflung rural villages of Huaibei, but are also the major commodity grain provided the country.

Though sweet potatoes are a high yield crop, but they are the cause of low yields of other crops. Sweet potatoes deplete the soil. When sweet potatoes precede wheat, wheat yields will be only slightly more than 100 jin per mu, 50 percent less than when soybeans precede wheat. If repeatedly grown on the same land year after year with little fertilization, soil fertility will drop sharply; wheat yields will become lower and lower; wheat yields will be unable to rise; and thus more high yield sweet potatoes will have to be grown. This will mean a reduction in the area available for the growing of wheat and difficulties in raising wheat yields per unit of area. Thus a vicious circle will be formed. In addition, sweet potatoes are a late crop. Spring-sown sweet potatoes are usually harvested in mid-October, and summer-sown sweet potatoes cannot be harvested until late October or early November. In the Huaibei region, however, wheat should be sown in early October, so by waiting until after the sweet potatoes have been harvested, the time for planting wheat is already late, and sometimes it cannot be planted. Portions planted produce reduced yields. As a result of the increased growing of sweet potatoes, wheat, soybeans and other spring sown grain crops have been elbowed aside. As a result the amount of land allowed to lie fallow during winter has steadily increased; it is difficult to arrange a proper crop sequence, and in many years spring-sown sweet potatoes are again planted. Thus, the area of one crop per year has increased, and the multiply cropped area has decreased. This has thrown into confusion the traditional rather rational farming system in which gaoliang, wheat, and soybeans were rotated in a three crops every 2 years system, or wheat and soybeans were rotated in a two crops each year system. Furthermore, sweet potato yields per unit of area show evidence of steady decline. This has been a major reason why for the past 20 years a steady reduction has taken place in the wheat and soybean growing area of the Huaibei region; yields per unit of area have been difficult to increase; long efforts have not raised wheat yields; the area sown to high yield crops such as corn has not expanded rapidly; the crop mix and crop patterns

have not been entirely rational; gross output of grain fluctuates without moving ahead; the fundamental change has taken place in Huaibei's low yields; and the people's standard of living has not risen.

Therefore, in order to build the Huaibei Commodity Grain Base, this irrational mix of overly large sweet potato growing area in proportion to a rather small wheat and soybean growing area will have to be changed. In view of factors such as the low soil fertility in Huaibei, in current planning, mostly crops that foster soil fertility should be planted and a transition made to green manure to make soil nurture paramount in a combination of use and nurture. Pulse crops such as green manure, peas, and soybeans, plus rape should be widely planted (they provide not only green manure, but also cake residue fertilizer as well), and once soil fertility has been increased, wheat yields per unit of area can be raised quickly and the wheat growing area increased, with a gradual reduction in the ratio of the sweet potato to wheat mix. Inasmuch as sweet potatoes currently provide yields that are consistently higher than other grain crops, plus the importance of sweet potato stems and leaves as fodder for hogs, cattle, and rabbits, the sweet potato growing area should not be reduced too much too quickly. While taking effective action to increase sweet potato yields per unit of area, efforts should be made over a period of 3 to 5 years to reduce gradually the sweet potato growing area from its present 30 percent to 15 percent of the cultivated land (about 5 million mu). In this way, an annual reduction in sweet potatoes averaging about 10 mu per production team could be achieved.

Corn is a high yield crop, and a major grain and livestock fodder crop. Its stems make a fine fuel, or they may be returned to the fields for fertilizer. In most part of the Huaibei region, the climate and soil are suited to corn growing. Corn has a fairly short growing season, superior varieties requiring only about 100 days. In Huaibei, it may be sown in both spring and summer, and may be consecutively cropped with wheat in a system of two crops per year. Corn is a high stalk crop that may be intercropped (or interplanted) with soybeans, sesame, peanuts, and sweet potatoes for remarkably increased outputs. So long as certain water and fertilizer conditions are met, a rather good harvest can be had in Huaibei. Yields are usually 500-600 jin per mu or as much as about 800 jin per mu. Following Liberation the area sown to corn in Huaibei has increased more than six fold; nevertheless, its ratio to grain crops as a whole is not large. In 1977, the area sown to corn was only 9 percent of the total area sown to grain (with spring-sown corn accounting for 80 percent of the total), and output was only 10 percent of total grain output. By improving water and fertilizer conditions, Huaibei will be able

to expand its corn growing area to about 15 percent of the total area sown to grain, and it can grow mostly summer-sown corn, in a system of two crops per year, one of wheat and one of corn. Summer-sown corn can be planted on 20 percent of the land from which wheat has been harvested. For the short term, some of spring-sown corn growing area may be retained for the growing of corn, wheat, and soybeans (or some other summer-sown crop) in a system of three crops every 2 years.

Though rice has been grown in the Huabei region for a fairly long time, particularly along the Huai River, up until Liberation very little was grown. Generally it was "plant rice when there is rain, and plant dryland grain crops when there is no water." There was no large area over which paddy rice was grown fairly consistently. Though some development of rice culture occurred following Liberation during the First 5-year Plan, still the area was not large. In 1957, the paddy rice area was 1.4 million mu, only 3.2 percent of the cultivated area that year. In 1959 when Huabei promoted "rice reform," though the growing area reached 2.9 million mu, yields were very low, nor did rice planting become ingrained. By 1961, the rice growing area declined to only 200,000 mu. After 1970, as a result of the compulsion and misguided direction of the "gang of four," their agents, and their gangster cadres in Anhui Province, the rice growing area expanded year after year reaching 1.8 million mu, or about 5.5 percent of the cultivated land, in 1977. Because of the large amounts of manpower used, yields averaged only about 400 jin per mu. In view of water and fertilizer conditions in Huabei, particularly the lack of sources of water for irrigation, the rice growing area could not be expanded. There was a great difference between volume of precipitation and volume of water needed to irrigate ricefields in Huabei. Furthermore, most of the soil in Huabei, particularly the vertically fractured black gritty soil areas, is very porous. A rice field that is irrigated will drain completely dry overnight. In addition, looked at in terms of regional division of labor for agricultural production in the province, the Huabei region should be a dryland crop area in which wheat is dominant, so there is no need to transform drylands to wetlands. In future, only where prevailing conditions favor it, where water is abundant, and where soil porosity is fairly slight in areas along the Huai should general methods be adapted to local situations for appropriate development of rice culture. In some saline-alkaline stretches in the north where ground water is abundant, some rice may be grown in combination with removal of soil salinity and alkalinity. Along the Huai River, wheat and rice, or rape and rice, or green manure and rice may be rotationally cropped.

During the period of the First 5-year Plan, the gaoliang growing

area in Huaibei was very large occupying about 8 to 10 million mu, or about 20 percent of the total cultivated land area, each year. Subsequently, as a result of expansion of spring-sown crops such as spring sweet potatoes, the gaoliang area declined greatly. In 1977, it was only 1.4 million mu or 4.4 percent of the total cultivated land area. Consideration should be given gaoliang's drought tolerance during its seedling stage and its tolerance of waterlogging later on, its indispensability in Huaibei today for building houses and making various things needed in daily life, its use as a principal raw material for making the famed "Gujing" liquor of Huaibei, and the enrichment of the soil that gaoliang provides as reflected in the saying that "wheat grown after a gaoliang crop is like that obtained after having had an invited guest in one's home" [who produced additional nightsoil]. In future, along with efforts to increase gaoliang yields per unit of area in Huaibei, the gaoliang growing area should also be revived to about 10 percent of the total cultivated area, i.e., to about 3 million mu. and a three crop system of gaoliang, wheat, and soybeans may be reinstated.

Soybeans are one of the three major crops of the Huaibei region after wheat and sweet potatoes. They are a major dual use crop that provide both grain and oil. Soybean cake residues are an important livestock feed and fertilizer, and soybeans are a major non-staple food raw material in the areas farflung cities and countryside. Consequently, in addition to their use as a grain, soybeans are also called a "five materials crop" in Huaibei.

Soybeans add fertility to the soil. Much growing of soybeans nurtures soil fertility, and yields are high when wheat follows a soybean crop. The growing of soybeans to nurture the land and a two crop system of soybeans and wheat have been traditional farming practices in Huaibei. When soybeans are planted early, they may be harvested in late September for no interference with the planting of wheat. The soybean growing area in Huaibei had been very large at one time. In 1952, a 12.87 million mu area was sown, which amounted to 57 percent of the total area sown that year to grain and soybeans, and 50 percent of the area sown that year to wheat. Historically Fuyang Prefecture annually transported about 400 million jin of soybeans for sale in Guangdong, Guangxi, Fujian, and Shanghai. After 1958, the soybean growing area began to shrink, amounting in 1977 to only slightly more than 7 million mu, or 16 percent of the total area sown to grain and soybeans, and 40 percent of the area on which wheat had been grown. Huaibei's soybean production also occupied an important position for the province as a whole. In 1977 its area sown to soybeans and its total output of soybeans amounted to 80.5 and 71.5 percent respectively of the totals for the province. In view of the role of soybean farming in Huaibei's crop rotation system,

as well as the important position of soybeans in Huaibei's agricultural production and in the province as a whole, Huaibei must actively revive and develop soybean production and take the path of one crop of wheat and one crop of soybeans. This is the principal direction of attack in the Huaibei region's future development of agriculture. The area sown to soybeans in Huaibei can go as high as about 10 million mu or between 40 and 50 percent of the area planted to wheat so that soybeans will stand second to wheat in Huaibei's crop mix, and so that Huaibei will become the greatest commodity soybean production base in the province.

Except for rice, the growing of which is concentrated in areas along the Huai River, production patterns for grain and soybean crops in most parts of the Huaibei region should be principally wheat and soybeans with corn, sweet potatoes, and gaoliang being secondary in the practice of a system of two crops per year or three crops every 2 years. Each county or commune should adapt general methods to local situations to designate crop rotation areas and practice regional specialization in agricultural production.

Aside from the aforementioned crops, the Huaibei region also grows cash crops such as cotton, sesame, peanuts, flue-cured tobacco, and ambari hemp, all of which are suited to Huaibei and all of which have a fairly good production foundation, occupying a fairly important position in the province as a whole. (See table below for 1977 statistics)

	Cotton	Sesame	Peanuts	Flue-cured Tobacco	Ambari Hemp
Proportion of Provincial Area Sown	43.5%	66.8%	33.9%	60.5%	69.1%
Proportion of Provincial Output	29.4%	57.5%	23.2%	61.5%	62.1%

Therefore, simultaneous with the building of a commodity grain base in the Huaibei region, production basis to supply the province with cotton, sesame, peanuts, flue-cured tobacco and ambari hemp can also be built. Their sown area may be suitably enlarged and their total output further increased so that they occupy a certain proportion of the farm product mix in Huaibei. The cotton growing area may be increased from its present 6.6 percent to between 8 and 10 percent of cultivated land for about 5 percent of the total area sown to farm crops. The area sown to

sesame, peanuts, flue-cured tobacco, and ambari hemp may be increased from the present 0.7 to 1 percent to 1 to 1.5 percent of the total area sown to farm crops. These crops should be suitably concentrated in their regional distribution in a re-adjustment of the present irrational situation of scattered distribution. Counties having the best conditions and where a certain foundation already exists for their growing may be selected, and they can be grown in concentrations on continuous tracts in individual areas so that they will become specially designated specialized areas for the growing of cash crops. Cotton can be concentrated in the old cotton growing areas of the north in Xiao and Tangshan counties, at Linquan and Taihe counties in the west, and in the new cotton growing areas of Su and Lingbi counties to the north of the Xinbian River in the east. Sesame may be concentrated in the west in Linquan, Jieshou and Taihe counties, and in the northern part of Su County in the east. Peanut growing may be concentrated largely along the Huai in Yingshang and Fengtai counties, and along the shores of the lower reaches of the Ying River, as well as along the shores of the Wu He in the east and the lower reaches of the Tuo River in Guzhen County. Flue-cured tobacco may be concentrated in the existing high yield areas where a good foundation for its cultivation already exists in Bo County and in some communes in Guzhen and Huaiyuan counties in the south. Ambari hemp may be concentrated along the Huai River in Funan, Yingshan, and Huaiyuan counties.

To summarize the foregoing, crop distribution in the Huaibei region may be divided into the following three zones (or belts). The area north of the Xinbian River and most of Bo County, as well as parts of Taihe and Linquan can be the wheat, soybeans, cotton, flue-cured tobacco, and sesame growing area. The region along the Huai River in the south may be the wheat, soybeans, paddy rice, peanuts, flue-cured tobacco growing area. The vast area in the central region may be the main grain crop area for the growing of wheat, soybeans, corn, and sweet potatoes as a base within the Huaibei Commodity Grain Base.

Sketch Map Showing Farm Crop Areas in Huabei Region of Anhui

- I Wheat, Soybean, Cotton, Flue-cured Tobacco, and Sesame Area
- II Wheat, Soybean, Corn, and Sweet Potato Grain Crop Area
- III Wheat, Soybean, Rice, Peanut, Flue-cured Tobacco, and Ambari Hemp Area

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CSO: 4007/63

CROP PATTERNS MATCHED TO CLIMATE IN HEXI CORRIDOR

Beijing NONGYE BUJU YU QUHUA [AGRICULTURAL DISTRIBUTION AND ZONING] in Chinese Mar 82 pp 205-207

[Article by Zheng Baoxi [6774 1405 0823], Geography Department, Gansu Teacher Training College, and Quan Dengqing [0356 4098 1987], Institute of Agricultural Science, Former Zhangye Prefecture: "Effects on Crop Patterns of Atmospheric Temperature and Irrigation in the Hexi Corridor (Ganhan District) of Gansu Province (Excerpts)"]

[Text] The Hexi Corridor is located in the northwestern part of Gansu Province and has been a pass into central Asia ever since Han and Tang times. During the long process of historical development, this area has produced not only highly cultured and artistic people such as the Mogao, but has also developed irrigated agriculture on a fairly large scale. The broad masses of working people accumulated rich experiences in the restructuring and use of nature, and rational distribution of agricultural production. Our past experience in surveying and studying the air temperature and use of water for irrigation in the Hexi Corridor demonstrated the effects of this crop distribution in the hope of achieving rational crop patterns to increase agricultural production.

1. Effects of Altitude Above Sea Level and Air Temperature on Crop Patterns

Farm crops make certain demands on their external living environment. In the external living environment for farm crops in this region, air temperature has a major impact on the area distribution of crops. The farming area of the Hexi Corridor extends from Dajing (in Gulang County) in the eastern Wuxiao Range in the east to Nanhu at Dunhuang in the west, the straight line distance from east to west being 900 kilometers. It extends from the foot of the Qilian Mountains in the south northward to Zhongqu in Minqin County and Tianshang in Jinta County, the width north to south being about 180 kilometers. Since this is the area in which the Mongolia-Xinjiang High Plateau meets the Qinghai-Tibe-

tan High Plateau, the elevation above sea level is rather high (ranging from 1,000 to 2,600 meters, a difference of 1,600 meters). As elevation above sea level varies, the vertical distribution of air temperature becomes quite marked. The higher the elevation above sea level, the lower the temperature and the shorter the frost-free period. The lower the elevation above sea level, the longer the frost-free period. As elevation above sea level and air temperature change, crop patterns vary markedly. They may be divided into the following three general regions:

(1) The 1,800 - 2,600 meter area. This includes Dajing and Sishui in Gulang County, Gucheng and Xigong in Wuwei County, Weiqi in Shandan County, and the region to the south of Sanbao in Minle County, as well as the areas along the mountain of Xinba in Gaotai County, and Tunsheng and Jinfosi in Jiuquan County. In this area the elevation above sea level is fairly high and air temperatures fairly low. Annual cumulative temperature when the average daily temperature is above 10°C is about 2,000 degrees and the frost and freeze free period is 120 days per year. Crop varieties are currently rather few, and mostly only summer crops are grown including wheat, highland barley, peas, rape, and linseed. Because of the short frost-free period, the principal autumn crop is potatoes; broom corn millet and corn often fail to ripen well.

(2) The 1,400 - 1,800 meter area. This includes Wuwei, Hexibao, Shandan, Zhangye, Linze, and Jiuquan counties, and Yumen Town. The cumulative annual temperature when the average daily temperature is above 10°C is about 3,000 degrees, and 130 to 160 days are free of frost and freezing annually. Within this region, substantial numbers of both summer and autumn crops are grown. Summer crops consist principally of wheat, broad beans, rape, linseed, and hemp. Autumn crops consist principally of corn, millet, and potatoes. In some years autumn grown millet and broom corn millet do not ripen very well.

(3) The area below 1,400 meters. This includes Dunhuang and the area running from Anxi County to Sihu, Jinta and Minqin counties, Huanaizi in Yumen County, and the area along the Hei River in Linze and Gaotai counties. Elevation above sea level is fairly low in this area, and air temperatures fairly high. Cumulative temperature for days on which the average daily temperature is above 10°C is about 3,500 degrees, and 100-odd days are frost and freeze free annually. In addition to the wheat, broad beans, and linseed grown as summer crops, and the corn, millet, broom corn millet and gaoliang grown in autumn in the aforementioned areas, cotton can also be grown here. Along the Hei River, paddy rice is also grown. This area has a fairly long period that is free from frost and freezing, and multiple

March the following year, and increases strikingly during April and May. Between June and September the flow increases rapidly. Thereafter, and until November, it falls sharply again. April and May, and October and November are periods of normal flow, and June to September are times of flood. The difference in flow between the period of normal flow and flood time is very great. For example, at the Zhamashike Hydrology Station in the Hei River system, the volume of flow between July and September is virtually five times greater than during April and May or October and November. Through long term involvement in agricultural production, the working people have accumulated valuable experiences about the right combination of summer and autumn crops for sensible use of water to meet the dynamic needs of farmlands. Summer fields are sown mostly during mid to late March (winter wheat having been sown during mid to late September), and harvested during mid to late July. Autumn crops are sown mostly between mid-April and early May, their harvest beginning in late September. The time of sowing of both summer and autumn crops varies by more than 30 days, and the time of harvest varies by more than 60 days. The period when summer crop irrigation (including summer soaking); and autumn crop irrigation is occurring simultaneously is largely from May to September. This is the state at which the volume of flow in the rivers is greatest. When flow is small prior to May, mostly the fields to be harvested in summer are irrigated; when flow decreases after September, late stage irrigation of summer crops and winter irrigation of other fields is done. This shows that by linking the summer and autumn crop fields in a sensible way on the basis of the annual volume water in each area, and by planning the area to be planted to summer and autumn crops is of great significance for the area's rational use of water, and for consistently high yields of grain crops and other crops. If summer and autumn fields are planted in proper proportions, no water shortage will be created. If the summer crop area is too large (and in some places summer crops account for 90 percent of the total area sown), and the fall crop area is too small, that will inevitably mean that the summer crops will not fit in with a situation of small volume of flow before May, and thus it will not be possible to irrigate promptly and the periods of rotational irrigation will be delayed. This will mean that full use will not be made of the waters that come in the autumn. Of course, if the proportion of autumn crops is too large and the proportion of summer crops too small, serious damage will also be done. In building farmlands that produce consistently high yields in the Hexi Corridor, a major problem in arriving at rational crop patterns is a rational combination of summer and autumn crops that fits in with seasonal changes in the volume of flow in rivers.

cropping may be done following harvest of summer crops. The foregoing facts show that an understanding of the air temperature conditions in each area and study of their effect on crop distribution holds major significance for rational arrangement of crop patterns and consistently high yields from farming.

2. Effects of Irrigation on Crop Patterns

In most parts of the Hexi Corridor, a portion of the area along the mountains excepted, annual precipitation ranges from 40 to 200 millimeters. Natural precipitation does not suffice crops needs for normal growth, and irrigation is extremely important for development of farming. Without irrigation, there would be no farming industry. The rivers that rise in the Qilian Mountains are the principal source of irrigation water for this region. The amount of flow in each river and the seasonality of flow has great bearing on crop patterns.

Most of the Hexi Corridor is a tilted plain running from the base of the mountains on which the land is basically flat but not completely continuous. The Hei Mountains and the Dahuang Mountains (or Yanzhi Mountains) divide the corridor into several segments to form three separate inland plains and three corresponding inland water systems, namely the Shiyang River water system (on the Wuwei and Minle plains), the Hei River water system (on the Zhangye and Jiuquan plains), and the Shule water system (on the Anxi and Dunhuang plains). These three water systems all rise in the Qilian Mountains, and the rivers depend on melting and rainfall in the mountain region for their replenishment. The upper reaches of streams are high and precipitous gorges, and after they flow out of the mountain region, some streams suddenly disappear underground. In flood and alluvial plains areas, some of them emerge to the surface to form groups of springs, which converge to form creeks, which flow into rivers. Surface water and ground water form a totality and constitute a source of irrigation for the farmlands of this area. The total volume of flow of rivers in this region is about 7 billion cubic meters (the volume of runoff through mountain passes); however, by no means full use is made of this amount at present. Most of it drains away to become ground water; thus, the lining of riverbeds with stones and use of ground water are of major significance in assuring water for farmlands and for expansion of the irrigated area and the size of the crop growing area. In the succeeding section, discussion will be devoted to the effects on crop patterns of seasonal changes in the volume of flow in rivers.

The flow of rivers in this area depends on melting and precipitation in the Qilian Mountains. Flow is least from December to

On the basis of the foregoing heat and water conditions in each part of the Hexi Corridor, plus taking into account current local technical and economic conditions, the following generalizations may be made about rational crop patterns for each area:

(1) Areas along the mountains more than 1,800 meters above sea level: Fairly high and cold with a short growing season. Under present technical conditions, it is not yet possible to assure consistent yields from crops in autumn-harvested fields (only potatoes grow well). On the other hand, wheat, highland barley, broad beans, and rape produce fairly consistent yields in summer harvested fields. Thus a higher ratio of summer crops is rational. However, for summer crops to account for more than 90 percent of the total crops grown is also irrational, because this will mean that some wheat fields cannot be watered. Moreover, there will be too much continuous cropping as a result of which wild oats will run rampant; a labor shortage will result; and this will lead to a fall in yields. Practice has demonstrated that a rational combination of crops for this area is as follows: Wheat occupying about 66 percent of the total area sown, with broad beans as a summer crop and potatoes as an autumn crop accounting for about 34 percent of the area sown in the rotational cropping of wheat - wheat - potatoes, and broad beans for consistently high yield economic results.

(2) Areas at an elevation of from 1,400 to 1,800 above sea level where the growing season is fairly long. Here, not only can summer crops be grown with assurance, but autumn crops such as corn and millet may also be planted (though they will not mature in some years). On the basis of conditions, summer crops should predominate in this area, because yields from summer crops are fairly consistent. However, in some areas summer crops have formed 80 percent of the total, which is too large a ratio. It does not fit in with the volume of water coming down the rivers, and consequently crops cannot be watered on time. Furthermore, the continuous cropping of wheat has impaired rational crop rotation, with the result that soil fertility cannot be revived or increased. Experience with rational use of this area's conditions shows a fairly good proportion between summer and autumn crops to be 7:3 or 6:4.

(3) Areas below 1,400 meters below sea level. In this area the growing season is longer than in the other two, and temperature conditions for the growing of both summer and autumn crops are fairly good. The varieties of crops grown is also greater than in the other two areas. In addition to wheat, miscellaneous summer grains, corn, broom corn millet, millet, linseed, and melons, cotton may also be grown here, and in some places paddy rice may be grown. In places having fairly good conditions, the

area sown to autumn crops may be proportionately increased. In general, the proportion of summer to autumn crops should be 6:4 or 5:5. This proportion not only helps rational use of water, but also helps in revival of soil fertility.

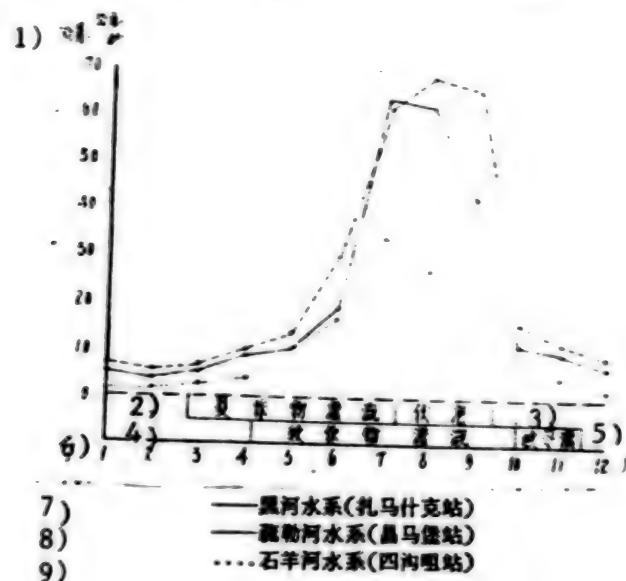


Chart Showing Curves For Changes in Volume of River Flow and Times of Summer and Autumn Crop Irrigation in the Hexi Corridor

- 1) [Illegible]
- 2) Summer Crop Irrigation
- 3) Summer Soaking
- 4) Autumn Crop Irrigation
- 5) Autumn and Winter Irrigation
- 6) January-December
- 7) ----Hei River Water System (Zhamashike Hydrology Station)
- 8) ——Shule River Water System (Changmabao Hydrology Station)
- 9)Shiyang River Water System (Sigouju Hydrology Station)

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4007/64

XUZHOU PREFECTURE TACKLES PROBLEMS IN BUYING, SELLING

Nanjing XINHUA RIBAO in Chinese 26 Oct 82 p 1

[Text] Starting out with the idea of supporting industrial and agricultural production and improving the lives of the people Xuzhou Prefecture has adopted effective measures to conscientiously resolve the problem of "difficulties in buying and selling."

In July and August, a large number of commercial workers at the prefectural and county levels went out to undertake practical investigation and, from first-hand materials, discerned the following new conditions and problems in this year's purchasing of agricultural sideline products and in the supply of industrial products: 1) Purchasing volume has increased by a large margin. Compared with last year, the amount of grain procured, purchased above-quota by the state and by negotiation in the entire prefecture showed an increase of almost 100 million jin; purchases of ginned cotton, oil and live hogs increased by 150,000 dan, 24 million jin, and 180,000 head respectively. 2) The business of settling accounts in procurement was difficult. Following the implementation of the system of responsibility for tasks until completion, the selling of more than 90 percent of the ginned cotton and more than 60 percent of grains and oil in the prefecture changed from the original approach of making the team deliver and settle accounts to making the household deliver and settle accounts; thereby increasing the business volume several times, and even several tens of times. 3) The reserves of oil and pork increased. At the end of August, the reserves of oil and pork in the entire prefecture increased by 1.9 times and 38 percent respectively compared with the same period the year earlier. 4) The purchasing power of the peasants greatly increased. According to the estimates, the purchasing power for the prefecture this year has increased by about 12 percent compared with that of the last year. In addition, the selectiveness of purchase also increased. The above-described situation has enabled the prefectural and county leadership to clearly understand that adopting positive measures which enable the peasants to sell the products they can sell and to buy the items that are available is not only an economic question, but also a political question. It is not only an unshirkable responsibility for the commerce and the supply and marketing departments, but also an important piece of work for every level of the leadership.

Next, the prefecture conscientiously implemented four concrete measures for resolving "difficulties in buying and selling": 1) Increase the number of

purchasing and selling locations. The prefecture established a total of 26 cotton, grain and oil purchasing stations, and increased the number of purchasing personnel by more than 2,000. Apart from establishing an additional 159 sales departments for selling industrial products and 77 selling-distributing shops, the prefecture also added a number of brigade-operated, self-managed stores and individual merchant households. 2) Undertake training in business techniques. The commerce, the supply and marketing and other departments in the prefecture have trained to date more than 1,700 vocational backbone personnel, thereby greatly increasing work efficiency and the quality and volume of the business. According to spot checks on 16 cotton purchasing stations, the accuracy in the grade of commodities reached 98.5 percent.

3) Improve purchasing methods. In the purchasing of grain, cotton and oil, the prefecture commonly adopted the methods of making preliminary contracts, setting specific times, and rotating its purchases. By further improving accounting methods, commune members selling cotton only have to stand in line twice to sell rather than five times as before. Crowding and spending the night at purchasing stations no longer take place. 4) Organize to deliver goods to the countryside, and launch purchasing at individual houses. According to statistics, in the months of July and August, the prefecture organized more than 10,000 persons to send goods to the countryside. At the same time it also held 106 county fairs and village fairs to display and sell commodity products. The amount of goods sold came to more than 3.56 million yuan. Many purchasing stations also organized their force to go to individual households to make purchases.

Owing to the leadership's giving it serious attention and to effective measures, the question of the peasants' "difficulties in buying and selling" in the prefecture has taken a turn for the better. By 20 October, the prefecture had purchased more than 485,000 dan of ginned cotton, which is a 58 percent increase over the same period last year. The rapidly-improving Feng County and Fei County have already overfulfilled their quota in purchasing ginned cotton for the entire year.

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CSO: 4007/51

NANTONG PREFECTURE FOCUSES ON PREVENTION OF COTTON DISEASES

Nanjing XINHUA RIBAO in Chinese 28 Oct 82 p 2

[Text] "To actively cure the fusarium wilt and verticillium wilt of cotton is not only related to the flourishing or decline, the existence or disappearance of Nantong's cotton regions; but it is also related to whether or not we will be able to make contributions in realizing the great goals established by the 12th party congress. All levels of cadres and the masses of commune members must give serious attention to this!" This was the urgent requirement raised not long ago by the Nantong Prefecture Committee and Administrative Office for the entire prefecture. By means of extensive and penetrating discussions, comprehensive preventative measures were formulated to "protect the disease-free regions, control the regions where disease is not serious, transform the regions which are seriously affected, eliminate the scattered and individual cases, and try within 2 or 3 years to bring fusarium wilt and verticillium wilt of cotton under control." These measures are known to every household. A mass movement to tend and protect agricultural land which is carrying disease is just now developing throughout the prefecture.

The cotton fields of Nantong Prefecture make up almost 5 percent of the entire country's cotton acreage. The cotton output several years ago was consistently almost 10 percent of the total output for the country, which made it one of the country's high cotton output regions. However, for 2 or 3 years, cotton output has not risen. Why was that? After the investigation by the prefecture's leading organizations, the serious situation was clearly seen: the area that was afflicted by cotton fusarium wilt this year has reached 27.1 million mu, which is an increase of 8.7 times over 1974. Of these, more than 1.35 million mu have serious plant disease. This year, the actual area was 150,000 mu after discounting the loss of harvest and the dead seedlings, which is 5 percent of the entire prefecture's cotton fields. Cotton fields that are afflicted by the disease generally have a reduced output of 20 or 30 percent and at most 60 percent. Calculating reduced output at 20 percent, the entire prefecture suffered a loss of 400,000 or 500,000 dan of cotton. Although areas that were afflicted by the verticillium wilt of cotton were not as great as those afflicted by fusarium wilt, the speed at which it spread greatly exceeded that of fusarium wilt. A survey in 1979 showed that the prefecture had only over 800 mu of disease-afflicted cotton fields. This year it has 106,052 mu, an increase of 206 fold within 3 years. The development of verticillium wilt is slower than that of fusarium wilt because clear symptoms appear only during the blooming period.

By this time there is no way to rescue the disease-stricken cotton; a reduced output and harvest loss become a foregone conclusion. Verticillium wilt is not only a devastating disease for cotton, but also the fierce enemy of many other crops. In view of the above, the prefecture's leadership, apart from urgently mobilizing the broad cadres and commune members to discuss comprehensive measures for prevention, also specially invited experts to make a special report to all levels of cadres, so as to develop confidence and determination to overcome the damage from verticillium and fusarium wilt. Thereupon, the entire prefecture adopted the following vigorous measures:

--Tightly seal off the regions and epidemic points where verticillium wilt exists. Assign people to pick cotton; burn all cotton stalks and fallen leaves, and administer pesticides to the disease-stricken soil. Concerned departments should all independently purchase, process, store, and transport fusarium wilt and verticillium wilt cotton. They are to employ high-temperature treatment of the disease-stricken cotton oil and, apart from using them as industrial raw materials, destroy on the spot the disease-afflicted cotton seeds, cotton cake, and fragments. As regards peanuts, hot peppers and eggplants that were afflicted by verticillium wilt, they must be strictly controlled so that they don't spread to the disease-free areas.

--Strictly select and reserve nonafflicted fields, cultivating them as seedling beds to grow next spring's cotton. Adopt measures to guard against soil already contaminated and bacteria-carrying objects from entering into non-afflicted areas. Every county and commune must have rules stipulating that seeds cannot be exchanged with the disease-afflicted areas. All those who violate these rules will be investigated and affixed the economic responsibility. For brigades whose cotton fields are stricken severely, cotton seedlings must not be retained. The seed company of each county will make a uniform adjustment in supplying seeds.

--Rotate crops rationally so as to reduce the amount of bacteria in the soil. In enacting regulations governing autumn ploughing, two counties changed their old custom of intercropping grain and cotton and instead, implemented rotational cropping of pure grain and pure cotton. The cadres and commune members of other counties also adjusted their stubble fields, so as to insure that one-third of the cotton fields next year will be planted with rice or dry land grain; this will reduce repeated cropping in the same field. These disease- and pest-reducing measures have already been carried out by individuals, households and on parts of fields.

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NATION'S FIRST AGRICULTURAL SCIENCE RESEARCH CENTER ESTABLISHED

Shanghai WENHUI BAO in Chinese 16 Oct 82 p 2

[Text] Traveling west from Xian for about 2 hours by train along the Longhai line, one reaches the town of Yangling in Wugong County, Shaanxi Province. China's first agricultural science research center--the Wugong Agricultural Science Research Center--is located here.

Tradition has it that Wugong was the fiefdom in which Hou Ji, agricultural minister to Yao and Shun--the forefathers of the Chinese people--taught farming to the people. Now this area has row upon row of higher education institutions and agricultural science research units. The Northwest Agricultural Science Institute, which has a history of 50 years, is located on the highest place north of the town. Located on the east and west of the town are various higher-learning institutions such as the Shaanxi Provincial Agriculture and Forestry Science Institute, the Northwest Soil and Water Conservation Research Institute, the Northwest Plant Research Institute, the Northwest Water Conservancy Science Research Institute, the Northwest Forestry Academy, the Shaanxi Provincial Forestry Science Research Institute, the Shaanxi Provincial Agriculture and Forestry School, the Shaanxi Provincial Water Conservancy School, as well as the Wugong Agriculture Science Research Center Coordination Committee, which has as its priority the coordination of the division of labor, cooperation in work actions and the joint tackling of key problems.

In schools and science research units, there are more than 20 specialties in new technical applications, such as soil and fertilizer, water and soil conservation, crops and improved varieties, agricultural meteorology, agricultural machinery, plant classification, biological heredity, ecology and physiology, plant protection, agricultural economy, farmland and water conservancy, water conservancy projects, animal husbandry veterinarian, forestry, fruit trees, vegetables, and silkworms and mulberry plants. They have more than 2,590 scientific and technical personnel. Of these, there are over 160 teachers, research personnel, and high-level engineers. There are more than 2,000 mu of experimental bases, more than 1 million volumes of scientific and technical books, and more than 150 scientific research instruments worth more than 10,000 yuan. For many years, these scientific research teaching units have achieved more than 600 positive results in scientific research and educated 20,000 high- and middle-level scientific and technical personnel. They have made a contribution in developing our country's agriculture, and they have been hailed as a "scientific and technical general staff department directing agricultural production."

At the beginning of last year, China's first agricultural science assembly hall, with a total area of more than 9,000 square meters, was established here. It is a place specifically for agricultural science and technical workers to engage in scholarly exchanges. Several agricultural science conferences have already been held here with the participation of well-known Chinese and foreign scholars.

The scientific and technical personnel of the Wugong Agricultural Science Research Center rely upon the fertile soil of 800 li of the Qin River, abundant library materials, and modernized instruments and facilities to engage constantly in scientific research which bring ample results. During the visit, the responsible comrades of the Science Research Center's Coordination Committee introduced us to several encouraging examples. Professor Zhou Rao [0719 7437], a famous entomologist of the Northwest Agricultural Science Institute, has engaged in research on insects for several decades, and achieved outstanding results. He edited the KUNCHONG FENLEI XUEBAO [JOURNAL OF ENTOMOLOGICAL TAXONOMY], which enjoys both a domestic and international reputation. This journal has invited 20 world-reknowned scholars on insect classification to serve as a news editing committee. This journal exclusively publishes papers, short reports, and scholarly discussions on insect classification, which include new viewpoints and accomplishments on taxonomic principles, systems, techniques and methods, etc. Professor Zhou Rao is now more than 70 years of age, but still rushes about on the front line of scientific research and teaching. Research worker Li Zhensheng [2621 2182 5116], of the Northwest Plant Research Institute, an All-China Model Laborer and one of the 12 Advanced Red Flag model workers of Shaanxi Province, has for several years continually engaged in research on distant hybridization. His success in the experimentation in the hybridization of wheat and perennial long-spike oat grass not only made a great contribution in theory, but also in cultivating the improved high-yielding, lodging- and disease-resistant varieties of Xiao Yan No 4 and No 5. This experiment in hybridization led to large-area increases in wheat yield, with outputs exceeding 1,000 per mu. ...According to the preliminary statistics of concerned departments, just the one variety of improved wheat developed by the experts of the Science Research Center and popularized and planted in the winter wheat regions of such provinces as Shaanxi, Henan, Hebei, Gansu and Shanxi alone allowed for more than 100 million and 3,000 square mu, with an increased grain output of approximately 10 billion jin.

By using methods such as holding classes for the communes and brigades, convening discussion meetings, signing contracts to demonstrate how to multiply improved varieties, going into the fields to give on-the-spot guidance, inviting peasant technicians to be their assistants, the scientific and technical personnel here teach science and technology and help the masses solve production problems. Professor Zhao Hongzhang [6392 3163 3864] of Northwest Agricultural Science Institute, a well-known specialist on wheat breeding, and Xu Baoshan [6079 1405 6365], party branch secretary of the Xiaojiagu Brigade of the Yangling Commune, Wugong County, and a national farm labor model, stand as beacons for scientific experiments in agriculture. The contract signed by them to demonstrate how to multiply the improved varieties works as follows: Zhao Hongzhang gave Xu Baoshan all kinds of improved varieties of wheat to breed and popularize, and making them responsible for technical guidance;

Xu Baoshan arranged for the labor force and the land, and supplied experimental materials for Zhao Hongzhang. The hearts of the specialist and the labor model are united in achieving the same goal. In February of this year, when the wheat started to turn green, there was a big snowstorm in the central Shaanxi plain. Zhao Hongzhang immediately went to Xiajaigu, along with Xu Baoshan, to inspect the growth of the spring seedlings. They decided right away to harrow the fields to hold the moisture in the soil. They would then apply top-dressing so that the second and third layers of seedlings could take advantage of the moisture. When the wheat entered the milk period and began to become yellow and mature, Zhao Hongzhang again would make trips to Xiajaigu where, along with commune members, he formulated concrete measures to prevent damage by disease and insects. This year, of the 920 mu of wheat produced by the Xiajiagu Brigade, the average per mu yield reached 800 jin, making it the highest level in history. Whenever the Xiajiagu commune members speak of bumper harvests, they all say that they want to record the meritorious service of Zhao Hongshang.

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FOUR PROPOSALS TO SPEED UP SOYBEAN PRODUCTION VIEWED

Jinan DAZHONG RIBAO in Chinese 17 Oct 82 p 1

[Text] Shandong Province originally had been one of the important soybean producing regions of the nation. After liberation, the annual acreage always was above 30 million mu to produce about 3 billion jin of soybean a year. After 1958, due to a preference for grains, soybean acreage dropped steadily. In 1980, the soybean acreage went back to 10.42 million mu and total production rose to 1.68 billion jin, but the serious contradiction between supply and demand has not been alleviated. Restoration and development of the province's soybean production have, therefore, become very urgent tasks.

With respect to methods of restoring and developing soybean production in the province quickly in order to satisfy the needs of the nation and the people, Zhao Jingrong [6392 4842 2837], senior agricultural specialist, chief of the Soybean Research Office, Institute of Crops, Shandong Provincial Academy of Agricultural Sciences believed that problems of the following four aspects should be earnestly resolved.

(1) The role of soybeans in the national economy and its function in ecological balance should be correctly understood. Soybeans are a nutrient crop, used both as protein and oil. They contain about 40 percent protein, 5 times that of rice, 4 times that of corn, 2.5 times that of wheat, and higher than that of pork as well. Their oil content is about 20 percent. Soybean oil amounts to one-third of the total production of vegetable oils in the world forming an important solution to mankind's problem of edible oil supplies. Soybeans also have extensive uses in light industry, food industry, and the pharmaceutical industry, in more than 400 types of products. At the same time, soybeans are symbiotic with root nodule bacteria capable of fixing free nitrogen from the air. According to tests, the nitrogen fixed by each mu of soybean per year is the equivalent of 35 to 65 jin of standard ammonium sulfate. Its residual stems and leaves in the soil can also improve the soil physical-chemical properties to nurture soil fertility. Soybeans have, therefore, an important function either in improving the food structure of the people, or in providing raw materials for industries, or in maintaining soil nitrogen balance through participating in crop rotation.

(2) The link between grains and beans should be correctly organized to practice a reasonable layout. At present, with regard to the crop ordering of grains and beans in the province, two tendencies deserve attention: One is that some high-yield regions blindly expand grains at the expense of beans and cause the ratio of soybeans to become smaller and smaller in the crop rotation systems. The soil nitrogen balance is thus severely destroyed. Even with annual applications of large quantities of chemical fertilizer, a high yield cannot be sustained. Production cost is thus much higher resulting in decreased economic benefit. Second is the fact that some low-yielding regions blindly expand beans at the expense of grains. Soybeans are being repeatedly planted, over and over. Although field management measures are applied, the yield remains unimproved. Experiments have proved that if soybeans are continuously planted for 3 years, there will be a yield reduction of 27 to 60 percent. The grain-bean ratio should, therefore, be harmonious if all types of crops are to have evenly increasing yields. According to the current condition of soil fertility and agricultural production level of the province, in regions of a per mu yield of wheat of about 500 jin, the acreage of bean crops should be the equivalent of 30 to 50 percent of the wheat acreage. With this type of arrangement, the soil nitrogen balance may be maintained and the crop rotation of beans and grains may also be reasonably practiced.

Soybean is a crop of high regional requirements. Based upon the natural characteristics of Shandong and the growth characteristics of soybean, the province may be divided into the following 3 regions of commercial soybean production: The first is the region along Huanghe in the southwestern part of the province, mainly Heze, Cao County, Chengwu, Dan County, Juye, Huicheng, Juancheng, Dongming, Liangshan, etc. Here the annual rainfall is 600-800 mm; the annual mean temperature is 13-14°C. The frostfree period is long, there are 2,400 to 2,600 daylight hours making it the warmest region in the province. The habit of basin-irrigation of the region has caused the soil to be highly fertile and also contents of such trace elements as calcium, magnesium, manganese, etc., to be relatively high. The region is very suitable for the growth of soybeans, with a great potential for yield increase. It should be the province's major base for commercial soybeans. The second is the northwest part of the province including mainly Wudian, Zhanhua, Lijin, Kenli, Guangyao, and Huimin, etc. This is a vast region, sparsely populated, with adequate conditions for establishing a [soybean] base. If basin-irrigation is adopted, the soil nitrogen and potassium content may rise to more than 3 times the original while the phosphorus content may be increased 5 to 20-fold. Although the soil is relatively fertile, its texture is very poor. At present, due to saline and alkaline damage, soybean acreage cannot be stabilized. In the future, with control and treatment of saline and alkaline lands, the region will develop into the province's major base of commercial soybean production. The third is the four lake region of the south which may be further divided into three small districts according to the cropping system. One is the soybean cropping district to the west, including Jiaxiang, Jinxiang, the northwestern part of Jining, and the southwestern part of Wenshang. This is an important soybean producing district and is also the region of the highest rate of commercial grade soybean. The second is the central

district with a corn and soybean intercropping system, centered in the plain of Yanzhou to include Qufou, the western plain of Zheng County, and the northern part of Jining, etc. The third is the region of soybean cropping on rice paddy embankments, distributed chiefly in the lowland areas along the lakes of Yutai, Jining, Jinxiang, Jiaxiang, and part of Weishan, a district of rice production. Generally, 30-40 jin of soybean may be harvested from each mu of paddy embankment, sometimes as much as 50 jin/mu. If it is managed well, each year an increase of 25 to 40 million jin of soybean may be harvested from this district alone.

(3) Advanced technology should be extended to improve unit yield. At present, the "six-change and one-insistence" method must be implemented. That is to say changing low-yielding poor species to high-yielding superior species, changing the method of broadcasting in stubbles, to plowing and turning stubbles [before seeding], changing late seeding to early seeding, changing natural density to thinning seedlings to a determined density, changing no fertilizer application to increased application of phosphorus fertilizer and supplementing nitrogen according to the appearance of the seedlings, and changing dry seeding and dry management to irrigation in stages; and insisting upon prevention and control of diseases and pests. Moreover, attention must be given to improve the basic conditions for the growth and development of soybeans. Soybean crops in Shandong are 80-90 percent summer soybean and generally stubbles are not removed and the field is not plowed for seeding soybeans; neither basic fertilizer or seeding fertilizer is applied. Under this cropping condition, not only is the soil fertility poor, but the soil texture is also very hard, with poor water retention and drainage capability and poor ventilation producing many unfavorable factors for the growth and development of soybeans. Practices here and abroad have proved that one of the important conditions for high-yielding soybeans is a high content of organic matter in the soil. The soils of Shandong's soybean producing regions generally have an organic matter content of 0.8 to 0.9 percent, not above 1.2 in the high organic content areas. There are 3 measures to change this thin and poor soil structure condition: (1) Increasing the application of farm fertilizer in large quantities; (2) turning over wheat stubbles into the soil; (3) intercropping green manure in wheatfields. In addition, the method of deep hoeing in trenches between mounds of soybean during the seedling stage is an obviously effective method of improving soil ventilation; on the average a yield increase of 8 percent may be obtained with this method.

(4) Scientific research on soybeans should be strengthened to advance science and technology and hence, soybean production. At present, combined with the reality of the province, the following 3 tasks should be earnestly attended to: (1) Research on selection and breeding of early ripening superior soybeans should be accelerated. Attention should also be given to breeding intermediate-ripening varieties suitable for intercropping with wheat. Its properties should be mainly the unlimited pod formation type soybean with broad adaptability; the stalk should be 80-90 cm in height. The desired varieties should have strong stems, numerous pods and many beans per pod; the leaves should be medium to small in size and the photosynthesis efficiency should be high. As to quality of beans, they

should be mainly the high protein type, with a protein content above 40 percent, and at the same time a high oil content should also be considered (with an oil content above 21 percent). (2) While large acreage high yield experiences are continuously summarized, the principle of small area high yield should be studied to investigate further high and stable yielding soybeans on the bases of ecological, physiological, biochemical, and hereditary principles to find new approaches to large acreage large-scale yield increase. (3) Researches on prevention and control of soybean diseases and pests should be continuously strengthened.

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BETTER FINANCIAL MANAGEMENT OF CONTRACT HOUSEHOLDS REQUIRED

Beijing NONGYE JINGJI WENTI [PROBLEMS IN AGRICULTURAL ECONOMICS]
in Chinese No 10, 23 Oct 82 pp 16-20

Article by Zhang Xieyu [1728 6200 5940], Rural Work Department,
Jinzhong Prefecture CPC Committee, Shanxi Province: "Discussion
of "Contracting of Sole Responsibility for Task Completion to
Individual Households and Financial Management"]

[Excerpt] In the process of summarizing and improving agricultural production responsibility systems, fiscal management in the contracting of sole responsibility for task completion to individual households is a topic that merits particular study and serious attention. Here only the necessity for fiscal management following the contracting of sole responsibility for task completion will be taken up, and some not fully developed thoughts provided for reference on several key work areas that should be taken in hand, as well as on the problem of building a financial corps following contracting of sole responsibility for task completion.

Necessity For Strengthening Fiscal Management Following Contracting of Sole Responsibility for Task Completion

1. After the responsibility system of contracting sole responsibility for task completion was instituted, some people supposed that "now that sole responsibility for task completion has been contracted, there is no need for financial work; every family will act as its own accountant, and there will be no need for ledgers." However, the existing objective reality is quite the reverse. Following contracting of sole responsibility for task completion, financial problems are more conspicuous, work more complicated, and management more necessary than ever.

1. Practice of responsibility systems in which sole responsibility for task completion is contracted to individual households

has meant a fundamental change from centralized administration and centralized responsibility for profits and losses to household by household administration and individual household responsibility for profits and losses. The form of administration and management has undergone real change. However, this is certainly not the division of fields for individual farming; it remains a collective economy in which production teams are still the central accounting units. Therefore, the general function of financial management has not disappeared as a result of the contracting of sole responsibility for task completion to individual households. In units practicing the contracting of tasks to individual households, the central goal of production remains obtaining better economic effectiveness, and the state of a unit's economic effectiveness becomes an imponderable problem when divorced from financial accounting. Never mind financial resources; material resources too are nothing more than wealth in material form. As regards the production relationships that people form, whatever the form of ownership or distribution, or whatever the position and role of people in production, ultimately they are reflected in financial relationships. For example, no matter whether exchange is selling or buying; no matter whether consumption is consumption for production or consumption in daily life; no matter whether distribution is distribution among the country, the collective, and individuals or distribution of consumer goods to individual workers, the economic final accountings, the receipts and expenditures, and the economic transactions are all a part of financial activity. It may be seen that following the contracting of sole task responsibility to individual households, the basic production links in the reproduction process are inseparable from financial management. All one has to do is think back a little to the process of promoting responsibility systems of large scale assignment of responsibilities when there were instances in which no accountants were around or people were not familiar with accounting work, and the delays that resulted in building such a responsibility system, and one can understand the importance of financial management and how it has to be vigorously strengthened.

2. The necessity for financial management in the responsibility system of contracting sole responsibility for tasks to households is also fairly distinct from the methods of this responsibility system and from other forms of responsibility systems. It contains various new characteristics necessitating correspondingly new understanding and new methods in financial management work. One might say that in the process of establishing and improving the large scale assignment of task responsibility system, it is in financial management that the amount of work is greater and the difficulties more numerous.

First of all, in quite a few units practicing large scale assignment of responsibilities, inherited problems in financial management exist in varying degrees. The very reason why some units want large scale assignment of responsibilities is that their collective economies have not worked well, and they have become "three dependent" production teams that have been unable to solve even the problems of food and clothing for commune members. In these units, a vital problem is poor financial management, and serious extravagance and waste. The question is whether or not the financial problems that have come about in these units can be vanquished with one stroke following the practice of large scale assignment of responsibilities. They cannot be. Problems such as accumulation funds running in the red, commune members owing money to collectives, collectives owing money to the state, excessive wear and tear on fixed assets, and differences between ledgers and actualities will continue to be problems. Changes in the form of responsibility systems does not mean that "inherited problems" will naturally become resolved.

Second, in the process of organizing assignment of responsibilities, some units that practice large scale assignment of responsibilities have accumulated a varying number of new problems. In putting into effect responsibility systems wherein sole responsibility is assigned to individual households, the financial management problems that have to be taken care of, it is feared, are somewhat more numerous and somewhat more complex than in other forms of responsibility systems. Some collective fixed assets that had heretofore been collectively owned and collectively managed became managed by households following the contracting of responsibilities, and some others will become owned by households. With management being delegated downward, how will depreciation fees be withheld? When property becomes owned by households, how can its cost be recovered. How can the collectives' existing debts be paid off? Should they be deferred or amortized? Should overpayments by collectives to commune members that are debts in arrears be wiped off the books? How should this be done? In cases where the collective's public accumulation funds are in the red, should they be replenished? How should they be replenished. If there is some surplus, should it be used? How should it be used? After assignment of large scale responsibilities, should the account books that had formerly been set up continue to be used? Should those not used be changed? How should they be changed? Should the files of accounts of former collective centralized dealings be established? How? Should financial systems be drawn up? How should they be drawn up? How should accounting in the large scale assignment of responsibilities be set up? How should compensation be set? How should personal responsibility systems be established. Some units have started to solve problems of these kinds. But mostly

because of the short time and insufficient experience, in most units not only do less than satisfactory situations universally exist, but some of them have not been touched at all. In addition, in the course of changes in the forms of responsibility systems, in some individual units, collectively owned property has been auctioned off, damaged, dispersed, destroyed, or lost, bringing about new chaos in the financial work of these units.

Third, following establishment of responsibility systems of large scale assignment of responsibilities and the signing of contracts, there are many problems in the field of financial management requiring further study and solution. For example, in principle commune members are themselves responsible for their own living expenses, but what is to be done if some commune members have insufficient funds? If the collective advances them funds, will they be required to make repayment later on, and how will they repay? Earnings situations have to be reported to higher authority, but what about the portion "remaining that belongs to commune members?" Is that to be figured in too? What about the portion that commune members "guarantee the state?" How is it to be paid and hows is it to be figured? How much should "the sufficient amount to be left to collectives" be? How is it to be used? In addition to labor under contract, collectives also have some labor that is centrally administered. How should this labor be recorded; how is it to participate in distributions? All these problems are problems that cannot be avoided in the production process following large scale contacting of responsibilities. Financial management must be a part of the solution to these problems. Unless managed in the proper way, it will not be possible to say that production responsibility systems of large scale contracting of responsibilities have been perfected.

To summarize the foregoing, financial management following large scale contracting of responsibilities will not only continue its general function, but will have to meet special requirements. Any slighting or neglect of financial management following large scale assignment of responsibilities for task completion will seriously impair the perfection of this form of responsibility system itself, and this should be fully taken into account and clearly understood.

Several Problems of Financial Management in Units Where Sole Responsibility For Task Completion Has Been Contracted to Households

Following contracting of sole responsibility for task completion to individual households, there are a very large number of prob-

lems of fiscal management that require handling. Right now it is necessary to devote particular attention to the following three fairly prominent problems.

1. Protection and Management of Collectively Owned Fixed Assets. After the contracting of sole responsibility for task completion in rural production to individual households, obvious changes occurred in the management and methods of using fixed assets. Apart from some large farm machines, vehicles, water conservancy facilities, and collectively owned forests that lend themselves to centralization and which continued to be centrally managed and used by collectives, a portion of fixed assets such as plow oxen and medium size and small farm implements were contracted out to individual households permanently for their care and use (depreciation fees being withheld), or else a price was assigned such items and they were simply turned over to individual households (and money recovered for them). As time went on, the financial affairs of these units took on the following characteristics and circumstances: First, because of changes in the use rights (or ownership rights) of fixed assets, a yours and mine situation came about. Second, the "capital" or "value" of fixed assets fluctuated. Third, a greatly increased fluidity of contacts occurred in economic relationships between collectives and commune members. Under these circumstances, care of fixed assets became particularly necessary in the contracting of sole responsibility for task completion to individual households. As work kept pace, collective property was able to consolidate, and the productive capacity already formed was able to continue to play its role to attain the goal of using everything to the full. Otherwise, it would have been a case of "chaos" resulting from changes, chaos leading to destruction, with the emergence of the following situation for a weakening of the collective economy: The property that should play a role would be removed from use or cast aside and not used. Property that should maintain its value would be auctioned off at will or sold at inflated prices. Depreciation fees and the money value of property that should be collected would not be recovered, increasing commune members debts.

For this reason, following institution of the contracting of sole responsibility for task completion, concepts of protection, consolidation, and development of collectively owned property must be firmly established in the management of fixed assets, and full attention given the following points in actual work: 1) A thorough one-time inventorying of collectively own property and food. Use of questioning and examination, checking and sorting, verification of amounts, and making clear the amount of wealth so that ledgers and the actual situation are in agreement. When problems arise, the party's programs and policies should be

honored, situations distinguished, and correct handling given them. 2) For collectively owned property the principle should be followed of centralizing whatever should be centralized and decentralizing whatever should be decentralized so that everything is used to the full extent with the goal of promoting production, individual decisions being made as to what should be centralized and what should be decentralized. Neither overcentralization nor overdecentralization are desirable. But neither centralizing nor decentralizing, but simply taking property out of service is even worse. 3) For anything assigned permanently to households for care and use, a fixed depreciation fee should be collected. For things not released to households, a depreciation fee should be regularly retrieved. Neither depreciation fees nor assignment of a money value to things should be set too low, and repayment dates should not be overly long. For all monies recovered, the principle of "specialized household savings" should be adhered to. All money collected should be made a part of accumulation funds, and when depreciation funds are collected, they should be deposited in depreciation funds. Under certain conditions the foregoing funds may be deposited in special credit cooperative accounts to assure that such funds are not used for any other purposes.

2. Inventorying and Repayment of Collective Credits and Debts. In carrying on production, production teams often enter into various economic relationships internally or externally. Unless regular, periodic settling of accounts is done in these relationships, obligations will form.

Obligations may be classified as credits or debts. So-called credits are sums one has the right to collect, and are commonly termed funds outstanding, and include funds owed by state entrepreneurial units, by commune-run enterprises and other collective units and overpayments to commune members owed to production teams. By so-called debts is meant the production team's obligations or funds that must be repaid. These are commonly termed funds owing. They include loans due for repayment to the state (or to credit cooperatives) by production teams, deposits, and fees for electricity and water, as well as funds owing other collective units or as distributions to commune members within the production team. Up until the time of large scale contracting of responsibilities, when everything was done in the name of the collective, there was a general feeling of "no worry if debts are numerous." After institution of large scale contracting, both credits and debts have had to be cleared up.

First comes analysis of obligations. Apart from some funds owed other units for grain and funds owed commune members in a small number of units, most of the collective obligations of units

practicing large scale contracting of responsibilities are loans from the state that have come due for repayment. After institution of responsibility systems of large scale assignment of responsibilities, since payment of agricultural production expenses became the concern of commune members in contracting households, and loans of a production nature were no longer the responsibility of collectives, it is expected that the trend will be toward no increase.

The problems of arrears in repayment of loans due the state and payable by the collective will not increase greatly. But a conspicuous problem staring this responsibility system in the face is what is to be done about debts already "owing?" Not repaying them will not do, yet quick solution cannot be found. Commune members would not agree to their apportionment among commune member accounts. To ignore them would be unreasonable, first of all; there can be no renegeing on payment. Secondly, this would not be realistic because the annual interest is itself no small burden. Therefore active measures must be taken and every effort made to repay them gradually. Experiences everywhere show that following the large scale assignment of responsibilities, repayment of loans took the following forms: 1) Once commune member living standards have improved and their income has increased, by proper limitation of consumption and halting extravagance, that portion of income derived from the collectives centralized operations should be used to repay part of debts. 2) Loans for equipment that are due or overdue should be repaid year by year out of accumulation funds withheld from payments by commune member households. 3) When debts owing and credits outstanding are "triangular" relationships and intertwined, attention should be given to clearing credits (mostly funds owed by commune members to the collective). In a majority of units, commune member debts to collectives for overpayment of funds frequently are about the same amount as debts that collectives owe the state, so if credits were cleared up, debts could also be repaid.

Second is further analysis of credits. In units practicing large scale assignment of responsibilities, there will be some cases in which outside units owe funds, but not too many. Their credits outstanding are made up largely of commune member arrears in debts owing collectives as a result of overpayments. After large scale assignment of responsibilities, generally there has been no further distributions of consumer goods to commune members (all that remains is their own), so the trend will be toward no increase in new arrears in repayment of overpayments for the most part. However, if commune members are unable to pay their portion of grain to the amount set in agreements, and if commune members are unable to pay on time the depreciation fees

and use fees for property for which they have contracted, there is a good possibility of a new situation of "commune members owing the collective" developing. Therefore, solution to the problem of money owing units practicing large scale assignment of responsibilities will be manifested simultaneously in both the clearing up of old overpayments that are owing and guarding against new debts incurred in payment of funds. Following large scale assignment of responsibilities, all jurisdictions have come up with some workable means of solving this unsolved problem of arrears as follows: 1) In cases where commune members have difficulty in repaying in full money owing collectives, discussions are held and a repayment plan worked out on the basis of ability to repay. An agreement is signed and repayment is made over the years until the debt is cleared up. 2) Where official position was misused or other improper practices employed to obtain advances from the collective, the unrepaid funds used to build houses, add on rooms or purchase bicycles, sewing machines, and wristwatches, the funds must be repaid within a certain time. For all money not repaid, production teams may levy interest to be paid at the same rate that credit cooperatives charge for loans to commune members for living expenses. In cases where childless households or households enjoying the five guarantees [childless and infirm old persons who are guaranteed food, clothing, medical care, housing, and burial expenses by the people's commune] are genuinely unable to make repayment, if commune members agree, debts may be cleared by using public welfare funds. 4) Surplus funds resulting from payments of obligations, wages owing production team cadres and teachers in civilian operated schools, and wages for persons employed in commune and brigade operated enterprises that are turned over to production teams are to be made a part of commune member settlements of accounts. When such funds are owed commune members who owe money to the collective, they should be used to offset a portion of the debts owed. 5) Collectives may give priority to commune member households that have a surplus of labor and where conditions permit in the contracting of cash crop fields or industrial sideline occupations, deducting loan payments from earnings received as a result of the contracting.

3. Bookkeeping Following Large Scale Assignment of Responsibilities. Bookkeeping is a major function of accounting work and includes the posting of accounts, the balancing of accounts, and the preparation of reports and forms. After institution of the responsibility system of large scale assignment of responsibilities, the former situation of all activities being centrally handled by production teams as accounting units was changed. Did this mean that bookkeeping work had become simplified, was no longer important, or could be done or not as one wished. Not at all. In fact, the content and methods of bookkeeping work only

changed in order to meet the needs of the responsibility system of contracting sole responsibility for task completion to individual households; this positively did not mean that bookkeeping work had been eliminated.

It cannot be denied that with the large scale assignment of responsibilities, some accounting work was reduced or curtailed as compared with other forms of responsibility systems. A look at distribution shows that following assignment of sole responsibilities to individual households, the change from the former centralized verification of receipts and expenditures and from the former centralized distribution of consumer goods on the basis of workpoints to distribution on the basis of contract agreements simplified the verification of receipts and expenditures, the recording of workpoints, advance distributions of goods, and distribution of earnings in the former system of bookkeeping. A look at the scope of accounting shows that following contracting of sole responsibility for task completion, all production expenses as well as all sales of individual portions of products became the concern of the contracting households, and production team were concerned only with apportioning expenses for which the collective was responsible (such as electric bills), plus loaning and supplying to contracting households the production funds and basic materials such as seeds, chemical fertilizer, and pesticides. This greatly reduced the accounting procedures for keeping track of individual production receipts and expenditures in the production process. A look at management of property shows that following assignment of responsibility for work task completion to individual households, specific methods were used for contracting medium and small size assets used in production to individual households, and for large assets, specific specialized contracting of management was done. This greatly reduced bookkeeping procedures for accounting personnel in keeping track of the maintenance and repair of all property, movement of materials into and out of warehouses, and fees for the feeding and care of draft animals. However, at the same time certain work increased. Following assignment of responsibility for work task completion to individual households and distribution according to signed agreements, accounting work entailed collection and collation of economic data from past years to provide a basis for formulating agreements. As a result computation work of all kinds greatly increased. Following assignment of task completion to individual households, provisions had to be made to supply from portions surrendered by contracting households the wherewithal for cadres, school teachers in locally operated schools, barefoot doctors, the families of martyrs and military personnel, the households receiving the five guarantees, those injured in line of official duties, collective welfare activities, workers who farmed land for the families of service-

men and martyrs, and other centrally administered workers. In order to make equitable apportionment, accountants had to make accurate calculations, set apportionment standards, assign figures to individual households, and carry out distribution at the end of the year. After assignment of task completion to individual households, since not all the production of the collective economy was centrally accounted for, and since the portion going to commune members could not be just left out without being figured in, accounting personnel had to do statistical work on production by commune member contracting households. In short, following assignment of responsibility for task completion to individual households, there was both an increase and a decrease in bookkeeping work.

So, in an overall sense, what should be included in bookkeeping following assignment of responsibility for task completion to individual households? 1) Accounting for contract household payments to higher authority of grain, materials, and money. 2) Accounting of all production team expenditures including payments of tax funds, accumulation funds, public welfare funds, and management fees. 3) Accounting for fixed assets. Aside from fixed assets such as large farm machinery and equipment, electro-mechanical equipment, and houses under centralized collective management, most important is accounting for the property assigned or sold to commune member households. 4) Accounting for transactions. Most important of these is temporary production team loans to commune members of funds to get production started, income from sale of products for commune members, funds to be paid production teams by commune members for the contracting of draft animals, plus production team overpayments of funds and production team defaulted payments of funds to commune members dating back to before the assignment of sole responsibility for task completion. 5) Accounting for down payments on advance purchases. Down payments made by the state for advance purchases of agricultural byproducts constitute a major means of providing support to commune member production. Once advance purchase down payments have been allocated, collectives may not make any deductions from them, but must distribute them to individual households in accordance with state procurement quotas so that commune members can invest them in production. Following year end settlement of accounts, the unit that originally prepaid them must be repaid. 6) Accounting of results of production teams' total activities. This means both an accounting of both portions tendered by commune members entered into formal accounts and a figuring of portions "remaining that belong to commune members themselves" so that actual results of all production team production activities will be completely reflected. This statistical work includes inspection, collection, collation, and analysis. For results of

activities carried out by contracting households and expenditures they have made, statistics may be compiled through general checks on situations, through representative sampling, and through regular recording, with year-end collations being made. 7) Accounting for year-end final settlements and distributions. This means verification of all income and expenditures followed by a clearing of accounts on all requirements set down in written agreements, assuring that they are honored. Finally commune member transactions and other transactions should be handled.

In order to do a good job of bookkeeping after large scale assignment of responsibilities, attention must be given to ground work in which the "three establishments" are most important as follows:

(1) Establishment of good financial files. This means setting up files in accordance with definite requirements for receipts, vouchers, bills, and invoices, setting up account books, reports and forms, production plans and financial plans, plans for pre-distributions and year-end distributions, statistical forms and tables, property rights certificates, and copies of contract agreements made with other units. Such work is particularly necessary in units in which large scale responsibility for task completion has been assigned. There should positively be no "balling up of past data to make a mystery of what has gone on in the past" because of current large scale assignment of responsibilities to individual households.

(2) Establishment of Complete Financial Ledgers. There can be no bookkeeping without account books, failure to make entries in account books, or using forms and vouchers to take the place of account books. However, inasmuch as accounting entries and methods have changed since large scale assignment of responsibilities counties may restructure on the basis of current realities the six account books formerly centrally required by provinces. The following have been the several main ideas proposed for restructuring of account books: 1. The former "Worker Workpoint Register" may be changed to a "Register of Work Done for the Collective," or a "Register of Workpoint Balances." The former "Register of Advance Distribution of Goods" need be kept no longer. Instead a "Register of Final Settlement of Contracting" should be added. 3. The former "Fixed Assets Ledger," which no longer fully satisfies actual requirements, should be replaced with a "Property Contract Management Register." The former "Account Book of Commune Member Transactions" is to be augmented this year with a column for "Agreement Quotas to be Honored," which will include agreement quotas, year-end readjustments, and actual fulfillment of quotas." In order to compile statistics on results of all production following large scale assignment of

responsibilities to individual households, a "Commune Member Goods Receipts and Expenditures Statistical Form" and a "Commune Member Production Receipts and Expenditures Statistical Form" have been added so that income and expenditures for activities that cannot otherwise be included in account books may be recorded and collated.

(3) Establishment and Perfection of Fiscal Systems. Some of the formerly promoted systems are still fundamentally applicable. These include the receipts and expenditures planning system, the system for management of various funds, the system for assigning personal responsibility for accounts, money, and materials, the property use and management system, the cash management system, the system for examination and approval of expenditures, the income distribution planning system, the accounting system, and the system for turnover of accounting personnel. However, there are some individual systems whose content requires certain revisions in order to fit in with the financial work situation following large scale assignment of responsibilities.

Establishment of a Financial Accounting Corps In the Wake of Large Scale Assignment of Responsibilities to Individual Households

Following large scale assignment of responsibilities to individual households, the importance of financial work shows the urgency and necessity for establishing a financial accounting corps that is both red and expert.

Because of the rapid development of responsibility systems of large scale assignment of responsibilities to individual households and their widespread existence, the financial accounting corps is temporarily unable, in its present condition, to meet the changed situation. First of all, ideological understanding does not meet the situation. Some commune members and cadres suppose that following large scale assignment of responsibilities, the collective will make no investments, there will be no recording of workpoints for labor, no distributions will be made, and there will be no need for fiscal management. Some accountants suppose that accounting procedures will diminish; burdens will be lightened; and that accounting work will no longer be important. Some financial management personnel suppose that accountants will be busy farming the fields for which they have been assigned responsibility, so making entries in accounts and figuring up accounts will be something they do in passing, convening network station activities will be difficult, and there will be no way to take care of financial work. Second, work does not meet the

situation. Because of the lopsided understanding, there is a neglect of financial work all the way from commune and brigade leaders to units directly in charge. As a result, in some county units, last years accounts have yet to be settled, and income distribution has not been settled in some cases. This year new entries have to be made in account books, and the financial system awaits reorganization and improvement. Third, organization does not meet the situation. In some units, the accounting corps is not completely staffed; there is turnover of personnel; and there is a lack of vigor. Fourth professional levels do not meet the situation. Accountants do not understand their new professional duties following large scale assignment of responsibilities to individual households. Those who are unfamiliar with their duties and cannot carry them out are numerous. Faced with this situation, the emphasis in establishment of a financial corps should be on four suitabilities.

Suitable ideology requires mostly study, indoctrination, and personal practice in order to know with both the heart and the mind the necessity and importance of strengthening financial management work following large scale assignment of responsibilities to individual households.

Professional suitability means studying the profession, becoming familiar with the profession, and mastering new techniques of fiscal management and bookkeeping following large scale assignment of responsibilities through training and regular activities at network stations. Even some old accounting hands who have worked for many years require study. Without it, if they depend on old experiences, it is feared they will be unable to solve new problems.

Organizational suitability means a fully staffed, elite, and stable corps. It should be fully staffed so all accounting work can be done; it should be elite so accountings will not have to be done over several times; and it should be stable, meaning that accountants should not be moved around frequently. How can these three requirements be met? The "three completes" policy calls for gradual spread of accounting specialization. What does accounting specialization mean? It means that where formerly "individual production teams had accountants not specialized in accounting," a change will be made whereby "small teams will not have accountants but production brigades (or joint teams) will, and accountants will be specialists in accounting." After accounting becomes specialized, accountants will generally no longer be responsible for contracting the farming of responsibility fields (in cases where there professional duties are not taxing, they may contracting farming of only a small amount of land). Their main duties will be to do a good job of financial

work for several production teams. Their income will also come mostly as remuneration for their accounting function. Results of experience have everywhere shown the following several advantages from the specialization of accounting to meet requirements of production responsibility systems, particularly responsibility systems of large scale assignment of responsibilities to individual households: 1) Because specialized accountants are hand picked, their professional competence is usually fairly high, and they have a strong sense of responsibility. 2) Because they have been recommended by the masses and professionally tested, after which they are appointed and managed centrally by counties and communes, the accounting corps has relatively little turnover. 3) Since specialized accounting means that several production teams are served by a single accounting specialist, the number of accountants can be reduced, the burden on the masses lightened, and training expenses saved. 4) Since accounting specialists devote themselves exclusively to accounting work, and since a system of personal responsibility has been formulated for them, the quality of financial management work is improved.

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TITLE: "Studies on the Characteristics of Moisture Retention of Main Soils in Shanghai Area"

SOURCE: Beijing TURANG XUEBAO [ACTA PEDOLOGICA SINICA] in Chinese No 4, Nov 82
pp 331-343

TEXT OF ENGLISH ABSTRACT: The characteristics of moisture retention of main soils in the Shanghai area have been studied by the tension plate method (0-1 bars) and pressure membrane method (1-15 bars). Results showed that: In general, soil water suction was conversely correlated with soil water content. Under the low water suction, the soil water-holding capacity was dependent mainly on the content of organic matter, the adsorption of organic colloids and the influence of soil structure; while under the high water suction, it was closely related to the soil texture (i.e., the content of clay) and the molecular attractive force of specific surface area as well as the adsorption of organic colloids.

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The soil water content was decreased with the increase of soil water suction. However, the evaporation intensity of soil was decreased with the decrease of soil water content. Soil water content, evaporation intensity and soil water suction were closely related to soil texture. The heavier the soil texture, the more small pores were formed; the higher the evaporation intensity, the faster the water suction rose. For the same amount of water absorbed by crops, more energy was consumed by crops on the clayey soil than those on sandy soil. Therefore, the crops on the clayey soil are liable to suffer from drought, and adequate irrigation is even more urgently needed for the crops on this soil.

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TITLE: "Chemical Forms and Content of Arsenic in Some Soils of China"

SOURCE: Beijing TURANG XUEBAO [ACTA PEDOLOGICA SINICA] in Chinese No 4, Nov 82
pp 360-366

TEXT OF ENGLISH ABSTRACT: In this paper chemical forms and content of soil arsenic are discussed based on analytical data of 13 soil samples collected from 10 provinces of China.

Part of the procedures of fractionation of phosphorus in soil proposed by Chang and Jackson (1957) was adopted in the experiment for the separation of arsenic from soil. Forms of arsenic separated from the soils were adsorbed-, Al-, Fe-, Ca- and occluded-arsenates. Analytical results showed that the contents of the five arsenates mentioned above in the total contents of arsenic of the soils were 0-21.3 percent, 1.1-9.0 percent, 1.0-16.3 percent, 2.5-45.8 percent and 32.0-86.3 percent respectively.

It was also revealed that chemical forms of soil arsenic and its contents seemed to be closely related to the geographical distribution of soil types. With the zonal

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distribution of the soils in China, the occluded-arsenate was gradually decreasing, but the adsorbed- and Ca-arsenates were gradually increasing from the south to the north and from the east to the west.

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TITLE: "Soil Types and Their Distribution Characteristics in Gonghe Basin of Qinghai Province"

SOURCE: Beijing TURANG XUEBAO [ACTA PEDOLOGICA SINICA] in Chinese No 4, Nov 82
pp 375-382

TEXT OF ENGLISH ABSTRACT: Gonghe Basin, located in Gonghe and Qinghai counties of the Tibetan Autonomous Prefecture of southern Qinghai Province, is one of the main areas of food and oil crops of Qinghai Province. This paper deals with the basic properties of the main soil types and their distribution characteristics, as well as their utilization and improvement methods based on research data obtained from soil surveys during 1962-1965 and 1978-1980 in this basin.

The soils in Gonghe Basin of Qinghai Province may be divided into two sequences, i.e., that of alpine soils and that of steppe soils. Alpine soil was formed through the process of soddy-frozen-meadow or soddy-meadow. The soil in the sequence is characterized by young and litho-profiles with a pattern of A_s-A_1-C .

[Continuation of TURANG XUEBAO No 4, Nov 82 pp 375-382]

From top to bottom the profile may be divided into A_s , A_1 , AB and C horizons. The steppe soil was formed through the process of humus accumulation and calcification. The soil profile can be regarded as the pattern of A_1-B-C . In the Gonghe Basin, there are 6 great soil groups and 14 subgroups, among which the alpine meadow soils and subalpine meadow soils have their respective special conditions of soil formation and genetic characteristics. However, the subalpine scrubby meadow soil is very different from subalpine meadow soil in the soil formation conditions, the soil profile pattern and the chemical-physical properties. These differences should be regarded as the criteria for distinguishing the soils into the categories of the great soil group rather than those of the subgroup. The soils of different great soil groups require different ways and directions of the utilization and improvement.

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TITLE: "Micromorphological Diagnosis of the Fertility Characteristics of Paddy
Soils"

SOURCE: Beijing TURANG XUEBAO [ACTA PEDOLOGICA SINICA] in Chinese No 4, Nov 82
pp 383-395

TEXT OF ENGLISH ABSTRACT: About 180 thin sections of various types of paddy soil were examined using a polarizing microscope, and the relationship between the micromorphological features and the fertility characteristics of soil was studied. Based on the data obtained, seven micromorphological features are suggested as the diagnostic criteria for paddy soils.

1. Ferro-manganic concentrations, of which the following are most closely related to the fertility of paddy soils.

- a. Diffuse organo-ferrans. They are only found on the walls of voids and in the adjacent soil matrix in the cultivated horizon of highly fertile paddy soils.
- b. Rusty spots. Two kinds of rusty spots can be recognized. One is the reddish brown rusty spot, with hue 5YR, found in the highly fertile paddy soils. The other is the brown rusty spot, with hue 7.5YR-10YR, usually present in the lowly

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fertile paddy soils. In addition, the iron concentration density and the number of rusty spots in the cultivated horizon are also positively correlated with soil fertility.

c. Ferric rings around plant roots. In addition to the coloration, iron concentration density and amounts, the thickness of ferric rings may also serve as an indication for soil fertility.

d. Mangans. If a considerable number of mangans is found in the horizon beneath the plow pan in a paddy soil derived from the automorphous soil, such as red earth, the soil can be regarded as a lowly fertile type which has a "pluvial" moisture regime.

2. Voids. Soil porosity, especially the total porosity and vugh-porosity, in the cultivated horizon is increased with increasing soil fertility.

3. Flocculated and unflocculated matrix. There exists a flocculated matrix in the fertile paddy soils and an unflocculated matrix in the lowly fertile paddy soils.

4. Skeleton grains. This article shows the soils which have poor fertility characteristics due to an excess of sandy and silty skeleton grains. Occurrence of skeleton grains in these lowly fertile soils has been compared with that in highly fertile paddy soils.

5. Striated orientation of clays. In some heavy clayey paddy soils, the fine particles remain suspended as paste over a rather long time after tillage under flooded conditions. Consequently, the transplanted rice seedlings cannot stand

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well in such a pasty-like surface soil. Under crossed polarized light, a large amount of striated orientation of clays in the clayey matrix can be observed.

6. Carbonate concentrations. In the cultivated horizon and plow pan of the calci-compacted paddy soils induced by long-term over-liming or by the influence of limestone materials, the presence of various concentrations may be used as micromorphological indications of the degree of calcification and compaction of paddy soil and fertility characteristics.

7. Pedorelicts ("raw soil" blocks). In the cultivated horizon of incipiently developed paddy soils derived on red earths, the "raw soil" blocks originating from red earths can still be preserved.

The micromorphological features of paddy soils as diagnostic criteria of soil fertility characteristics vary with soil types. However, it is possible to use one or some of the suggested micromorphological features to diagnose the fertility characteristics of paddy soils under the microscope.

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Plant Breeding

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TITLE: "Advances in the Study of Hybrid Rice in China"

SOURCE: Beijing ZHONGGUO NONGYE KEXUE [SCIENTIA AGRICULTURA SINICA] in Chinese No 5, 20 Jun 82 pp 1-9

TEXT OF ENGLISH ABSTRACT: In recent years the growing area of hybrid rice in China has reached approximately 80 million mu, with the average increase in yield being over 50 kg per mu. Several new combinations with early maturity and strong disease-resistance have been extended to more than 2 million mu. The male sterile lines, such as D type, Zaiye, Dianrui 409, Tsunye and Aibei, have all formed a complete set of three lines (male sterile, maintainer restorer). The selection and breeding of three lines with long stigma and large anther as well as chemical emasculation have made progress. A whole set of cultivation techniques, including the raising of healthy short-statured seedlings and tillering by various methods, has been adopted extensively in hybrid rice production.

[Continuation of ZHONGGUO NONGYE KEXUE No 5, Jun 82 pp 1-9]

A great deal of research on the cause of development of heterosis and its forecasting, on the major economical traits of hybrid rice and the rules governing the inheritance of disease resistance, and on the genetics, cytology and biochemical mechanism of the male sterile of rice has been conducted, and good progress has been obtained.

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TITLE: "Studies on the Relationship of Oil and Protein Contents and Some Qualitative Characteristics of Soybeans"

SOURCE: Beijing ZHONGGUO NONGYE KEXUE [SCIENTIA AGRICULTURA SINICA] in Chinese No 5, 20 Jun 82 pp 48-56

TEXT OF ENGLISH ABSTRACT: The relationship between oil and protein contents and some other main qualitative characteristics of 348 soybean germplasms originating from northeast China were investigated to determine the indicator characteristics which could be used in the selection of breeding materials. Results showed that the colors of the seed, flower and pubescence could be used as indicator characteristics in the selection of high protein content materials, while in the selection of high oil content materials the color and shape of seed, pod color and cultivated type should be used. Based on these indicator characteristics, a lot of breeding materials of high oil or protein content could be obtained both in the field and the laboratory.

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